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USSR Report

TRANSPORTATION

No. 106

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MOTOR VEHICLE

SCIENTIFIC-TECHNICAL COOPERATION AMONG CEMA MEMBERS

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 6, 1982
pp 33-34

[Article by Vatslav Pinkava, CEMA Secretariat]

[Text] Motor vehicle construction is one of the leading sectors of the machine building industry of CEMA members and its specific weight in the gross output of machine building comprises from 14 to 24 percent in individual European members of CEMA.

Production of all types of motor vehicles reached 3.204 million in 1980 in CEMA countries, including 2.142 million compact automobiles, 1.078 million trucks and 126,000 busses.

Mutual deliveries of motor vehicles among CEMA members, including trucks, are increasing on the basis of agreements concluded on multilateral international specialization and cooperation in production.

The technical level and quality of the produced motor vehicles are also increasing constantly according to the requirements of the national economy of CEMA members and with regard to fuel conservation and environmental protection.

The multilateral cooperation of CEMA members in this field also contributes to development of production and to an increase of the technical level of the products of motor vehicle construction.

International specialization and cooperation in production and standardization are being implemented and forecasts and analyses of automotive production in the cooperating countries are being developed.

Scientific and technical cooperation plays an important role. Section 7 "Automotive machine building" of the Permanent Committee of CEMA for Cooperation in Machine Building is organizing work in this direction.

Cooperation is being accomplished in the following directions:

reduction of atmospheric pollution by the exhaust gases of motor vehicles, an increase of the reliability and engine life of motor vehicles, their units and parts, a reduction of the noise and vibration of engines,

improvement of driver's working conditions and an increase of the traffic safety of motor vehicles;

an increase of the fuel economy of motor vehicles;

development of improved isothermal motor transport equipment;

reduction of the consumption of copper and replacement of it in automotive production;

development of new progressive types of motor vehicles that permit more efficient use of them with minimum environmental pollution;

development and introduction of progressive methods of technology in automotive construction.

Four agreements were signed in 1972 on scientific and technical cooperation on problems of reducing atmospheric pollution by motor vehicle exhaust gases, increasing the reliability and engine life of motor vehicles, their units and parts, reducing the noise and vibration of engines and improving the driver's working conditions and increasing motor vehicle safety. Cooperation is being implemented according to these agreements and on the basis of operating programs and measures to implement them. A total of 98 operations directed toward improvement of motor vehicles produced, development of general methods of analyzing the toxicity of engines and tests, creation of test standards, improvement of the controllability and stability of motor transport equipment and an increase of their safety, reduction of noise and vibration and so on on individual subtopics were completed in CEMA member countries during 1978-1980.

The work was performed mainly within the deadlines provided and the results of some of them are being formulated in the form of technical reports.

Scientific and technical cooperation in the indicated problems are of considerable significance for the automotive industry of CEMA members, since it helps to solve problems of observing international rules and regulations in environmental pollution and motor vehicle safety.

Investigations to increase the reliability and engine life of motore vehicles, their units and parts according to the decision of section 7 to concentrate scientific and technical cooperation in more timely problems were completed in 1981 by working out summary abstract scientific and technical reports.

Along with positive results achieved in solution of the indicated problems, the existing deficiencies should also be noted. They may include, for example, the too wide a range of problems included in working out individual subtopics, duplication of topics at the institutes of the members and introduction of the results of investigations mainly in countries where individual subtopics are being worked out rather than in all countries of the socialist fraternity.

In this regard, section 7 plans during 1982 to work out proposals to increase the effectiveness of scientific and technical cooperation in solution of the indicated problems--to achieve more practical results from the scientific research work.

The primary task of the motor vehicle builders of CEMA members is to reduce fuel consumption. Scientific and technical cooperation in the field of increasing the fuel economy of motor vehicles was begun in 1980 by coordination of the future plan of operations for 1981-1985.

Cooperation of CEMA and SFRY member organizations, which includes, for example, improvement of methods of calculated investigation of fuel economy of motor vehicles, development of design components that guarantee an increase of fuel economy, working out recommendations on modernization of engines and development of new high-performance power plants, is provided on this topic in the plan.

The main investigations to improve isothermal motor transport equipment are directed toward development and testing of 18 standard dimensions, which would meet the requirements worked out by section 4 of the permanent committee of CEMA on cooperation in the field of transport and which would meet the rules of the European Economic Committee of the United Nations.

Experimental models of isothermal motor vehicles have now been developed and tests of 14 standard dimensions have been conducted by a method coordinated within the framework of section 7.

The nomenclature of 12 titles of makeup units, assemblies and parts suitable for specialization and cooperation in production, was also worked out within the given topic.

The problems of reducing copper consumption and replacement of it in motor vehicle production are being solved by development and introduction of aluminum radiators for the cooling system instead of existing copper radiators.

The technical assignment "Standardized dimension series of structural components of welded aluminum radiators for the cooling system of the gasoline engines of compact automobiles" was worked out in 1981. According to the suggestion of the participants in development of the given topic of the members, the technical assignment will be supplemented so as to disseminate it in the final analysis and for development of soldered aluminum radiators for trucks.

Final agreement and confirmation of the indicated technical assignment are planned for the current year.

As a result, this document should be the basis for development of the design, production processes, equipment and tools for aluminum radiators and also should be a guide in selection and use of sheet materials during manufacture of them.

The cooperation of CEMA members is directed toward development of power units (diesel engine, clutch and gear box) for trucks with capacity of 1-1.7, 3 and

8 tons or above and at engine rating of 200-360 horsepower and above, for trucks with capacity of 8 tons in the range of engine ratings of 360-450 horsepower and also for busses and truck trains based on them, in production of new progressive types of motor vehicles that guarantee more efficient use of them with minimum environmental pollution.

An agreement was signed in October 1981 on scientific and technical cooperation in development of these basic units.

The subprograms provide development of the main specifications, design work, manufacture of experimental prototypes and testing of them, transfer of prototypes to interested countries for testing and finishing the prototypes according to the comments and results of testing for individual categories of motor vehicles.

The coordinators of work in development of power units for trucks with capacity of 1-1.7 and more than 8 tons in the range of engine ratings of 360-450 horsepower are the delegates from the USSR and the coordinators for work in development of trucks with capacity of 3 and 8 tons and above in the range of engine ratings of 200-360 horsepower are the delegates from the CSSR. The corresponding organization from the SFRY is also participating in the cooperation.

Development of new progressive power units for trucks and busses and new motor transport equipment based on them is the most important problem of scientific and technical cooperation of CEMA members in automotive construction.

The problem of converting trucks to diesel engines, timely for some CEMA members, and the problems of reducing fuel consumption and environmental protection will be solved through joint efforts.

According to the work plan, the committee also plans scientific and technical cooperation in the field of developing diesel engines in 1982-1984 including diesel engines for compact automobiles.

Multilateral scientific and technical cooperation of CEMA members in development and introduction of progressive methods of technology in automotive construction was begun in 1980 by preparation of the corresponding agreement, which was signed in 1981..

The agreement provides for cooperation in the use of robots for precision CO₂ spot welding for sheet steel parts, improvement of electrophoresis grounding of automobile bodies and parts on the edges and internal surfaces of complex shapes and the technology and equipment for thermal removal of burrs from steel parts. Cooperation in this field was begun in 1981 and the corresponding organizations of the Peoples Republic of Bulgaria, the GDR, the Socialist Republic of Rumania, the USSR and the CSSR are participating in it.

Section 7 "Automotive machine building" is now devoting special attention to increasing the effectiveness of multilateral scientific and technical cooperation according to the decisions of the meeting CEMA Council and Executive

Committee. The work of the section is directed toward solution of the most timely problems through common efforts and toward increasing the specific weight of joint developments of new designs of articles and of new progressive techniques.

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CSO: 1829/46

MOTOR VEHICLE

LITHUANIAN OFFICIALS DISCUSS NEED FOR BETTER ROAD SYSTEM

Vilnius SOVETSKAYA LITVA in Russian 31 Oct 82 p 1

Report on discussion by the Lithuanian Communist Party Central Committee and LiSSR Council of Ministers concerning the development and improvement of local public highways and internal economic roads in rural areas: "More Good Roads for Rural Areas"

Text The decree which was approved notes that definite work has been carried out in the republic to develop and improve the public and internal economic road network in rural areas. Construction of public roads linking rayon centers with each other and with large settlements in rural areas has been essentially completed. Construction of internal economic roads has been improved somewhat. Lately the majority of them have been built in combination with land cultivation. Some experience has been accumulated in the construction and renovation of internal economic roads through the efforts of the farms themselves based on a cooperative of kolkhozes and sovkhoses within the framework of interfarm territorial associations.

However, the existing network of local public roads, especially internal economic roads, still lags significantly behind the increasing volume of shipments of agricultural produce and freight necessary for agriculture and the motor vehicle and machine and tractor fleet, and the shift to acceptance by procurement organizations directly on the farms of agricultural produce and its shipment by public transport facilities is being delayed, which is leading to large losses in agricultural production, as well as having a negative effect on civic improvements and the overall progress of rural areas. Quite a number of internal economic roads require renovation, and some of them must be completely rebuilt. Until now the matter of organizing repair and maintenance has not been resolved, as a result of which part of the newly built internal economic roads are being maintained unsatisfactorily and go out of service prematurely.

Some soviet and economic organs locally are devoting little attention to development of the network of internal economic roads, and are not utilizing available opportunities to the full extent to expand their construction and improve repair and maintenance.

In attaching great economic and social importance to further development of the road network in rural areas, which was also noted with the utmost clarity at the May (1982) Plenum of the CPSU Central Committee, the Lithuanian Communist Party Central Committee and the LiSSR Council of Ministers consider implementation of the necessary overall measures to develop and improve the network of public highways and internal economic roads to be one of the most important tasks of the Ministry of Land Reclamation and Water Resources, the Ministry of Motor Transport and Highways, the Ministry of Agriculture, the Ministry of the Fruit and Vegetable Industry, the Ministry of the Forestry and Timber Industry, the Administration of the Fishing Industry, and other ministries and departments which have enterprises and organizations under their jurisdiction in a rural locality, as well as the Alitus and Kapsukas gorkoms and raykoms of the Lithuanian Communist Party, rayispolkoms and their agriculture administrations, boards of kolkhozes, managers of sovkhoses and other state agricultural enterprises and organizations. At the same time, particular attention must be devoted to road construction in economically weak kolkhozes and sovkhoses and those remote from centers. The task of providing for completion of internal economic road construction in all farms over three to four five-year plans is being undertaken.

It is advisable to include in the network of local public roads the sections of internal economic roads which link local soviets, central settlements, and basic production centers of kolkhozes, sovkhoses, and other state farms and agricultural enterprises with the network of public roads.

It is necessary to increase the extent of contracted operations being carried out by organizations of the Ministry of Motor Transport and Highways for road building and repair of internal economic roads in rural areas and for construction of agricultural airfields, as well as for public services and amenities in rural settlements and production centers at the order of the Ministry of Agriculture, the Ministry of Land Reclamation and Water Resources, the Ministry of the Fruit and Vegetable Industry, and the Administration of the Fishing Industry under direct contracts with the farms.

The Ministry of Land Reclamation and Water Resources has been charged with carrying out operations for project planning and basically for the construction, renovation and capital repair of internal economic roads, and operations to maintain these roads must be implemented in accordance with the contracts with the farms.

The Ministry of Land Reclamation and Water Resources, jointly with the Ministry of Finance and other ministries and departments concerned, as well as with rayispolkoms, is to develop and carry out the necessary organizational and technical measures, taking into account the increasing amount of work to build, repair and maintain internal economic roads, to develop a production base of land reclamation construction and installation administrations and to establish in them specialized subunits to implement the operations indicated. To bring the amount of construction, renovation and capital repair of internal economic roads performed by the labor force of organizations of the Ministry of Land Reclamation and Water Resources up to no less than 1,500 kilometers annually by 1986 and up to 2,000 kilometers annually by 1990.

The Ministry of Agriculture, the Ministry of the Fruit and Vegetable Industry, rayispolkoms and their agricultural administrations are to organize implementation of construction and repair of internal economic roads with the labor resources of kolkhozes, sovkhozes, and other state farms and enterprises. With these objectives in view, to organize cooperative efforts by farms to the extent necessary.

Where there are internal economic roads more than 20 kilometers long, kolkhozes, sovkhozes, and other state farms have been advised to create specialized working groups for their repair and maintenance.

Gorkoms and raykoms of the Lithuanian Communist Party, gorispolkoms and rayispolkoms have been instructed to consider the possibility of enlisting the services of voluntary-assistance enterprises and organizations in the construction and repair of internal economic roads, mainly on economically weak farms.

Establishing by rayons the target for the construction, renovation and capital repair of internal economic roads in the period up to 1990, with all sources of financing, being carried out by contracting organizations.

It is necessary for the Ministry of Land Reclamation and Water Resources, the Ministry of Agriculture, the Ministry of Motor Transport and Highways, the Ministry of the Fruit and Vegetable Industry, the Ministry of the Forestry and Timber Industry, and the Administration of the Fishing Industry, jointly with rayispolkoms, to establish the priority of internal economic road construction stipulated by the plan for their development, in coordination with the periods for construction and renovation of public roads, as well as with the periods for construction and renovation of drainage and irrigation systems.

The Gosplan, Gossnab, Goskomsel'khoztekhnika [State Committee for Supply of Production Equipment for Agriculture], the Ministry of Land Reclamation and Water Resources, the Ministry of Motor Transport and Highways, the Ministry of Agriculture, the Ministry of the Fruit and Vegetable Industry, the Ministry of the Forestry and Timber Industry, the Administration of the Fishing Industry and rayispolkoms are to specify in the annual state plans for economic and social development the funds and material and technical resources in the amounts necessary to ensure fulfillment of the targets for construction and renovation, as well as for the repair and maintenance in the proper condition of local public motor roads and internal economic roads.

The Ministry of Agriculture, the Ministry of the Fruit and Vegetable Industry, and the Administration of the Fishing Industry, rayispolkoms, kolkhozes, sovkhozes, and other agricultural enterprises should render every assistance possible to contracting organizations carrying out construction and repair of internal economic roads in reinforcing their technical base, staffing with personnel, and establishing for construction workers the necessary cultural and personal conditions and in resolving other problems.

The Administration of Geology should intensify work to identify new sand and gravel deposits useful for opening pits for local use.

The Ministry of Land Reclamation and Water Resources and the Ministry of Motor Transport and Highways, with the objective of reducing the cost of internal economic road construction and repair, should organize the opening and exploitation of pits of nonvaluable construction materials for local use which are located near the road projects, in the established procedure.

Party, soviet and agricultural organs locally must intensify attention to the development of road construction in rural areas and road maintenance, conduct inspections, and take necessary stock of their technical condition.

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CSO: 1829/53

MOTOR VEHICLE

FRENCH PRESS REPORTS CONTACTS WITH RENAULT

Paris LE NOUVEL ECONOMISTE in French 15 Nov 82 p 67

[Text] Soviet auto production doubled between 1970 and 1975. Then it began to lag, for the last 7 years varying between 1.2 and 1.33 million units (1.324 million in 1981). The current 5-year plan provides for production of only 1.3 million in 1985, or the same level as in 1978.

The VAZ factory, on the Volga at Togliattigrad, which went into operation in 1970 after 3 years of construction, an \$800-million investment, and the benevolent neutrality of American General Motors, is still the largest in the country, with a maximum production capacity of 700,000 cars a year. It produces the Zhiguli, which is derived--like the Polish Polski--from the Fiat models 124 and 125 and is sold as the Lada in Western Europe. Expansion of its capacity, which was to reach 1 million cars with the addition of two assembly lines, is no longer one of the 5-year plan objectives. On the other hand, it is rumored in the Soviet capital that a California design group and Porsche have contributed to development of the future Lada (VAZ 2108), a front-wheel drive, 1,100- to 1,500-cubic centimeters model, with three or five doors, which will reportedly appear in 1984-1985. The Togliatti plant has also produced since 1977 the Lada Niva all-terrain vehicle (75,000 in 1981).

The Moskvich plants in Moscow and Izhevsk, which were to produce 400,000 cars a year, appear never to have reached their goal. Under study for several years, the unveiling of a new generation of smaller cars that would replace the present Moskvich series is still reportedly 2 or 3 years off.

The rest of the Soviet auto industry is divided among the establishments of GAZ; Gorkiy (named Volga and Chaika, for party and administration officials); ZAZ at Zaporozhye in the Ukraine (a front-wheel drive model range is reportedly planned for 1985, regarding which there have been informal contacts with Renault); UAZ at Ulyanovsk, which specializes in small all-terrain vehicles; and Zil in Moscow, which produces a small number of ceremonial limousines for government dignitaries. Among the main importers of Soviet autos are France (19,300), the United Kingdom (15,500) and Belgium (13,300).

9920

CSO: 3519/163

RAILROAD

OPERATION OF KAZAKHSTAN'S RAIL NETWORK DISCUSSED

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 10, Oct 82 pp 2-7

/Article by Yu. Z. Dzheksenev, chief of the department for transportation and communications of the Central Committee of the Kazakh SSR Communist Party: "The Contribution of the Kazakh SSR Railroad Workers"

/Text In his speech at a meeting in Alma-Ata that was devoted to the 60th anniversary of the creation of the Kazakh SSR and the Kazakh SSR Communist Party, Comrade L. I. Brezhnev said, "there are few governments in Asia with which one could compare that of the Kazakh SSR when it comes to the level of its development."

There is a certain amount of symbolism in the fact that today space ships are launched from the Kazakh SSR. In a sense it is the republic itself that is making the space flight. The assimilation of the virgin lands has provided impetus to the development of the Kazakh SSR's production forces and to the growth of its economy, science and culture. The republic has become a major grain and livestock center for the Soviet Union. And at the same time it has become a major, multi-sector industrial center.

It has become almost the norm for the republic to supply the nation with a billion poods of grain each year. There has also been a significant increase in the production of sugar beets, cotton, industrial crops, vegetables, potatoes and fruits. The number of head of cattle is increasing, as are the size of the poultry holdings. The production of livestock is increasing. The large and unique Karagandinsko-Termirtauskiy, Kustanayskiy, Pavlodar-Ekibastuzskiy, Alma-Atinsky, Karatau-Dzhambulskiy, Mangyshlakskiy, Vostochno-Kazakhstanskiy and other territorial-production complexes have been created and are now being developed. Nearly 90 percent of the Soviet Union's production of phosphorus, 40 percent of the feed phosphates, and a large amount of mineral fertilizer is produced by the Karatau-Dzhambulskiy and Chimkent enterprises of the Soyuzfosfor Association. The electric power industry, non ferrous and ferrous metallurgy, machine building, coal, chemical, petrochemical, light and food industries are growing rapidly. New cities and workers' settlements are being built.

During the years of Soviet power the industrial production of the Kazakh SSR has increased 900-fold. Today the Kazakh SSR produces in one week as much industrial product as it manufactured altogether in the year 1937; and in a year it produces five times as much as it did in all of the five-year plans that preceded the war combined. The extraction and transport of Ekibastuz coal is approaching 210,000 tons every 24 hours. For Karaganda coal the figure is 170,000 tons every 24 hours. And some 180,000 tons of ore and metallurgical raw materials are extracted and shipped every 24 hours.

A great holiday of unity and brotherhood was celebrated by all Soviet citizens in June of this year - the 250th anniversary of the voluntary joining of the Kazakhstan to Russia. For its successes in the economic and cultural building and in commemoration of this historic event, the Kazakh SSR was awarded its third Order of Lenin. Altogether the republic now has five orders.

In successfully resolving the problems of the social and economic development that face the Kazakh SSR the nearly 300,000 member collective of the railroad workers of the republic are participating actively. The role of rail transport in strengthening transportation and economic ties between oblasts and industrial and agricultural regions of the Kazakh SSR, in creating the necessary conditions for the development, specialization and cooperation of production in an unified national economic complex, and in providing a reliable and efficient functioning of the republic's economy cannot be overestimated.

Prior to the October revolution within the territory of present-day Kazakhstan there was only one poorly developed single-track mainline on the Central Asian line and three dead-end lines that were branched off of Russian railroads. The total length of the lines was less than 2,500 km. During the period of socialist conversions a well-developed railroad network was created; the length of these railroads exceeds 14,000 km. To these mainlines are connected almost 8,000 km of sidings to industrial enterprises and organizations; this is where as much as 80 percent of all freight work is accomplished. Today there are three large mainlines in the republic - the Alma-Atinskaya, Tselinnaya, and Western Kazakhstanskaya. In less than 12 hours these three railroad lines carry as much freight as was carried in an entire year in pre-revolution Kazakh SSR.

The rapid growth of the economy, culture and material well-being of the workers has made it necessary to take several steps to increase the carrying and throughput capacities of the lines that are used the most. It has also been necessary to improve the organization and management of the transshipping process and to speed up scientific-technical progress, and to extensively adopt the achievements of science and leading experience. A great deal of work has been done to strengthen and develop the material-technical base of the leading sectors of railroad transport during the 10th Five-Year Plan. Secondary tracks are being built on a large scale; the lines that are used most heavily

are being electrified and equipped with automatic blocking and dispatch centralization. Many junctions and stations, locomotive, railcar, passenger and freight enterprises have been improved significantly.

The Tselinograd-Ekibastuz and Karaganda-Moynaty sections have been electrified and new electric locomotives, the VL80T, have been put into operation; these developments have made it possible to increase shipments of coal and to increase the weight and speed of freight train traffic.

Work is underway to increase the throughput capacity of stations and to develop the production base of the locomotive depots and other sectors of the system using their own means. For example, at the Sorokovaya railroad station on the Tselinnaya railroad station workers have laid five acceptance and shipping tracks. At the Tselinograd railroad station the station track was equipped with automatic uncoupling devices of flexible hoses as was the track of overlap that leads into the city. At the Ekibastuz railroad station an additional five tracks were laid and lighting was improved. Much has been done using their own means to develop the Semipalatinsk railroad station on the Alma-Atinskaya railroad. More than 100 km of secondary main track, 17 station tracks at the Aktyubinsk-11 freight station, and a lot of track on other distinct points have been laid by the railroad workers of the Western Kazakhstanskaya railroad. As a result during the years of the 10th Five-Year Plan the transshipping of freight on the Tselinnaya railroad have increased by 44 percent, on the Alma-Atinskaya railroad by 19 percent, and by somewhat less on the Western Kazakhstanskaya railroad.

Several major steps have been taken to further develop passenger transport and to improve the service to passengers at stations and while travelling. Additional express trains have been put into operation between Alma-Ata and Chimkent, Karaganda, Petropavlovsk; nonstop trains are now running between Alma-Ata and Leningrad, Alma-Ata and Sochi and on to Simferopol'.

In recent years several large passenger terminals have been built and put into operation; these include terminals in Alma-Ata, Kokchetav, Aktyubinsk, Kustanay, and Pavlodar.

As the result of technical progress the Kazakh SSR railroads now have managed to do away with jobs connected with heavy manual labor such as track inspector, the main and senior conductors, the train railcar master, the fireman for the steam locomotive, the coupler, shoemaker, and there are few station masters and switchmen. The workers thus freed go to other jobs that are connected with servicing the new, more powerful and efficient equipment, and further improving the technology of the transportation process, the systems for managing them, and raising the efficiency of the utilization of the rolling stock and all other means of transportation.

At the same time that the republic's railroad transport is being re-equipped and further developed there is an increase in the number of personnel. Almost 16,000 specialists with higher and incomplete higher educations are now working on the railroads; another 28,700 workers have a middle specialized education. These workers are trained by the institute of the engineers of railroad transport that was opened in Alma-Ata in 1976, and by its Aktyubinsk branch. Another six railroad technical schools and several specialized institutions of higher learning at the higher and middle school levels also prepare workers. More than 5,000 railroad workers are taking correspondence courses or are enrolled in evening classes at divisions of the institutes and technical schools.

The Leading Role of the Communists

As they approach the 60th Anniversary of the formation of the USSR, the workers of the railroads of the Kazakh SSR are multiplying their efforts to successfully implement the decisions of the 26th CPSU Congress, the November (1981) and May (1982) plenums of the CPSU Central Committee, and the instructions and recommendations of Comrade L. I. Brezhnev for raising the efficiency and quality of the work on the entire transportation system.

The party organizations of the railroad transport are more vigilant and results-oriented in the work that they do in organizing and in their political-educational work. In accordance with the CPSU Central Committee decree regarding the need to improve party and political work in railroad transport, the influence of the party organizations upon the work of the enterprises of the sector is greater. A good deal of work has been done to improve the posting of party forces and to place communists in the key sectors of production. More than 25,000 communists are at work on the railroads of the Kazakh SSR. There is an upswing in the business skills and economic training for these workers. The labor activity of the workers, engineering and technical workers and employees is increasing.

Over the past two years an additional six party committees, more than 50 primary shop party organizations, in excess of 120 party groups have been established within the Kazakh SSR's railroad transport system. At this time there are 750 primary, 315 shop party organizations and more than 860 party groups.

The junction party committees, which exist at 38 junctions and railroad stations, play an important role in providing the smooth interaction of the enterprises, junctions and stations, and in carrying out plan assignments. They combine almost 500 party organizations and do a great deal of organizational and political work. Primary attention is given to improving the use of rolling stock, the development of creative initiative, socialist enterprise, increasing the role of the primary party organizations and achieving high final results in the work of the labor collectives.

As to how efficient the purposeful, active work of the party organizations can be, one can judge from the work of the Pavlodar junction party committee, which combines the party organizations of three railroad stations, locomotive and railcar depots, and several other enterprises of the junction. Since 1980 another two primary party organizations, five party groups, and 50 leading workers and specialists were made members of the party, were created within the junction. Instructional meetings are held regularly and experience is shared among the secretaries of the party organizations and party groups. The commission for monitoring the work of the administration in the use of rolling stock has been activated. Educational work has been improved and more attention is being given to maintaining discipline. The commission is raising the efficiency of socialist competition and the degree of responsibility of the workers for the jobs that they are given. And direct canvassing is being improved. In keeping with the experience of the Leningrad transport workers, a labor society has been organized among the collectives of the enterprises of the junction, mixed modes of transport and enterprises - the shippers and recipients of freight.

As the result of work done in 1981 at stations of the junction there has been a significant drop in the number of standdowns of railcars during loading, sorting and other technological operations; the quality of railcar unloading has risen during the night shift; and there has been an improvement in the use of the carrying capacity of the rolling stock. This has resulted in the freeing of some 28,000 railcars for other jobs.

The party committees of the Tobol'sk, Petropavlovsk and Tselinograd junctions demonstrate a great deal of initiative and purpose in their work. By reducing the amount of lost time for sorting operations at the Tobol railroad station in 1981 nearly 31,000 railcars were freed to carry other cargoes; at the Petropavlovsk station the figure was more than 20,000, and at the Tselinograd railroad station the figure was 35,000 railcars.

The work of the Makatskiy, Atbasarskiy, Sary-Shaganskiy, Tainchinskiy, Chimbentskiy, and Balkhashskiy junction party committees, the party organizations of the Arys' 1, Kokchetav, Kustanay, Gur'yev 1, Karaganda Novaya, the party committees of the Alma-Ata railcar depot and many other enterprises is remarkable for its high efficiency.

The collectives of the Yermontay railroad station on the Tselinnaya Railroad and the Chengel'da station on the Alma-Atinskaya Railroad have come forward with a valuable initiative. These collectives have organized a socialist competition for the rapid processing of trains. In 1981 they achieved a significant reduction in demurrage. This has made it possible to increase loading resources by about 10,000 cars.

The efforts of the 16 councils of secretaries from the party organizations of transportation, industrial and other enterprises have been directed at improving the organization of loading work and reducing railcar demurrage. These councils were established at the large junctions and stations. The council of secretaries of party organizations at the Atbasar junction on the Tselinnaya Railroad is achieving high results. Without constraining initiative of the party organizations of the enterprises, the council develops practical measures for reducing railcar demurrage based upon collective discussion. It also comes up with ideas for improving the content of the siding tracks and strengthening the loading and unloading work. In 1981 the station collectively overfulfilled its assignments for shipping freight and labor productivity; it also reduced railcar demurrage under a single loading operation and took steps to ensure the condition of shipments. As compared with 1980 there was a 17 percent drop in average demurrage of railcars on the sidings of enterprises; nearly 1,700 railroad cars were freed for additional loading during 1981.

An efficient measure for reducing losses of shipping resources is for the party committees and primary party organizations to establish commissions for monitoring the activity of the administration in the use of railcars. At present there are more than 1,400 such commissions; the task now is to widely disseminate the experience gained by many of these commissions. The creation in several locations, where it is feasible, of unified party organizations, which join together the communists of the line stations and the sectors adjacent to them, has demonstrated the merit of this idea which was proposed by the CPSU Central Committee. This has made it possible to strengthen the party and political work within these labor collectives.

The oblast, city and rayon party committees are providing a great deal of help in eliminating bottlenecks in the operation of the railroads, speeding up the construction of secondary tracks, developing the stations, and accomplishing other measures. For example, since the creation of the Western Kazakhstanskaya Railroad on the initiative of the oblast party committees the enterprises of the cities and rayons in Aktyubinskaya Oblast have backfilled 239 km of bed for the secondary main and station tracks; Kzyl-Ordinskaya Oblast - 186 km, Mangyshlaks-kaya Oblast - 22 km; and Ural'skaya Oblast - 39 km. In Aktyubinskaya and Tselinogradskaya oblasts industrial enterprises are supervising the locomotive depots.

With the active support of the Eastern Kazakhstan and Alma-Ata oblast party committees, the railroad workers, truckers and builders have organized the unloading of cement from railcars and its delivery by a fleet of specially equipped motor transport for all consignees in these oblasts. This significantly reduced the railcar demurrage and losses of cement during shipping; there also was a rise in labor productivity

A great deal of attention is being given to increasing the skills of workers and to keeping them on the job. Toward this end public personnel departments have been established at railroad stations, the locomotive and railcar depots, at track, signaling and communications sections, and other subelements. These departments review all paperwork regarding dismissals and in discussions with the workers explain the reasons and take steps required to eliminate problems. As a result many workers are remaining to work in railroad transport.

This work is being undertaken most actively on the Tselinnaya Railroad. More than 260 public personnel departments have been established on this line. More than 1,000 leading workers, engineering and technical workers and employees and representatives of public organizations are involved.

The apprentice system is very important in the educating, training and retention of young personnel. At railroad enterprises in the republic at present there are more than 14,700 "tutors" /nastavnik/. The tutors are doing a good job on the Tselinnaya Railroad at the locomotive depots in Tselinograd, Kurort-Borovoye, Pavlodar and at the Atbasarskaya and Kokchetavskaya signaling and communications sections, the Kokchetavskaya track section, and the railcar depots in Tselinograd, Atbasar, and Kushmurun. The leadership of the experimental production workers are giving a great deal of attention to young people at the Alma-Atinskaya and Zapadno-Kazakhstanskaya railroads. Tutors of young people are receiving a great deal of praise on the Alma-Atinskaya railroad: machinist-instructor N. F. Ognyannikov at the Zashchita locomotive depot; brigade leader Ye. Kadirizov, winner of a third degree Trudovaya Slava medal, at the Dzheskazgan track section; metal worker and diesel operator A. I. Dmitriyev at the Dzhambul locomotive depot; and many others. Hero of Socialist Labor M. Makhmetov, who is a shop foreman for repairing railcars at the Karaganda depot, has educated some 35 young workers.

Work has been improved in the professional orientation of students in middle schools. At present on the Alma-Atinskaya and Tselinnaya railroads there are some ten childrens' railroads in operation; these facilities are being used to train nearly 7,000 children. In order to strengthen labor education and to keep the lines of communication open between the public schools and the railroad some 64 shops and sectors have been established at enterprises for the training of students. Last year these childrens' railroads produced 620 graduates who along with their high school degrees received certificates stating that they were qualified to become assistants to diesel locomotive operators, metal workers for repairing locomotives, and electricians. These young specialists augmented the enterprises of the railroad transport sector.

There are hundreds of railroad worker dynasties working on the republic's railroads. Entire families and generations of families are carrying the labor baton. For example, the Abdrashidov family works on the construction and installation train number 636 at the Karaganda sorting stations. On the Karaganda section of the Alma-Atinskaya Railroad

the Khilov dynasty is well known - altogether this family has 220 years of seniority. On the Tselinnaya Railroad there are more than 130 working dynasties now working; at the Atbasar locomotive depot there are more than 20 such families.

There are 15 heroes of socialist labor, 16 meritorious transportation workers, and four republic and USSR state prize winners working on the republic's railroads.

In accordance with the CPSU Central Committee decree "concerning the further improvement of ideological and political-indoctrination work" questions having to do with labor, political and moral indoctrination of workers are being resolved on a comprehensive basis. The role of the railroad newspapers, which do a great deal of propaganda and organizing work, has been increased. Within the republic editorial councils have been established at the newspapers; these councils are comprised of representatives from the services and independent departments of the railroad administrations. The carrying out of rabkor /worker correspondent/ rallies is in practice. The role and responsibility of enterprise managers to perform political indoctrination work is being increased; and the tie between club work and the specific affairs of the labor collectives has been strengthened. The honoring of labor veterans and dynasty workers has become traditional under the slogan "they are ahead of their time". Another traditional practice is the parties that are devoted to a specific theme such as "praise to workers' hands" and "with our labor we are writing our biography". On the Alma-Atinskaya Railroad for the first time on the railroad network they have established a centralized trade union library system with its center in Alma-Ata, which joins 36 branches with a total library of 465,000 copies.

Within the republic there is a substantial program underway to improve the housing and living conditions of the railroad workers. Previously constructed housing units are being equipped on an extensive basis with central heating, water, sewage, and hot water during their capital repair. The gasification of railroad settlements has been totally completed. The network of hospitals, polyclinics, out-patient departments, medical centers, preventive medicine facilities, Pioneer camps, and childrens' preschool institutions is being expanded. Each year the number of populated centers using water that has been transported in is being reduced. On the Zapadno-Kazakhstanskaya Railroad the pace of the construction of social and cultural facilities and domestic services is twice that of industrial construction.

The Food Program - a Common Concern

In seeking to make its contribution to solving the Food Program, the republic's railroad workers started as early as last spring to prepare for the most urgent season of their work - the transportation of grain on a massive basis. This also includes the transport of other agricultural products of the new harvest as well. During the harvest the daily grain shipment reaches 1,200 railroad cars and up to 600 railcars of vegetables, potatoes, onions, melons and fruits. In cooperation

with the workers of the procurement organizations they have devised measures for the timely preparation of the needed number of railroad cars for transporting the harvest; these measures are now being put into practice. They have also developed measures to reduce the amount of railcar demurrage and to prevent losses and spoilage of product during transport. Toward this end they are creating additional mechanized centers for washing and preparing railcars, worker brigades at the centers, the needed supply of materials and spare parts for repairing boxcars; they are also setting aside the needed shunting means. During the washing of the railcars representatives from the elevators are already determining if the rolling stock is suitable for loading grain.

To maximize the use of boxcars on the Tselinnaya Railroad for the first time on the network they have started to use dense laths instead of grain shields. Specialized rolling stock known as grain cars are being used more and more during the transport of the harvest. The use of such railcars eliminates the need to prepare them over and over for shipping.

For the management of the process of shipping grain within the administration of the railroad and the departments they are establishing special operational groups of workers for the traffic, freight and railcar organizations. Such groups solve problems having to do with the organization of the passing and utilization of empty boxcars, the distribution of cars between the divisions, increasing the loading by lines, and other problems. At the computer center of the Tselinnaya Railroad they have introduced a program for a computer to solve the "grain" problem; they have also automated the accounting of all data connected with the preparation of railcars, the loading and shipping of grain for all stations and divisions of the railroad.

In carrying out the decisions of the May (1982) Plenum of the CPSU Central Committee, the Kazakhstan railroad workers are actively participating in realizing the Food Program. On the railroads experience has been gained in creating and developing subsidiary farms. For example, on the Alma-Atinskaya Railroad during the years 1979 through 1982 four state farms and 14 subsidiary farms were added to those already in existence (two sovkhozes and two subsidiary farms). In addition, five bee-keeping facilities, a pond farm and three hothouses were organized. Some 16 pens for 10,000 sheep, six barns for 700 head of cattle, feed lots, several feed shops and two centers for pasteurizing milk were built.

In 1981 the Alma-Atinskaya Railroad produced more than 340 tons of meat, 510 tons of milk and nearly 800,000 eggs. It holds more than 1,200 head of beef cattle, including 277 cows, 1,600 head of pigs, 92,000 chickens, 96,000 hectares of agricultural land, including 8,400 hectares of plowed fields.

Two sovkhozes and 12 subsidiary farms now exist on the Tselinnaya Railroad; and there are one sovkhov and seven subsidiary farms on the Zapadno-Kazakhstanskaya Railroad. The subsidiary farms have been created and are now being developed. Workers on the independent lines are being given needed help in acquiring and maintaining their own cattle and poultry.

At many of the independent lines fruit orchards have been planted. For example, in 1981 alone more than 74,000 fruit and decorative trees and shrubs were planted on the Zapadno-Kazakhstanskaya Railroad.

The High Efficiency of Competition

Having commenced the labor watch in honor of the 60th anniversary of the formation of the USSR, the Kazakh SSR railroad workers are devoting a great deal of attention to the creative adoption of leading experience, to speeding up scientific-technical progress, to improving the planning of shipments, to the efficient interaction with maintenance organizations and enterprises, and to strengthening conservation efforts and reducing transportation costs. The initiatives of the leading transport collectives including the experience of the work of innovators on the republic's railroads, which were approved by the CPSU Central Committee, are being shared on a broad basis. The socialist competition among the the collectives of the stations and enterprises - the shippers and recipients of freight - for reducing railcar demurrage on railroad sidings, which was organized on the Kazakh SSR railroads, is characterized by its high efficiency. The related organizations in Karatau, Zhelezorudnaya, Pavlodar and Ust'-Kamenogorsk achieved particularly significant labor successes. Thus, as a result of the cooperation of the railroad workers, motor transport workers and river transport workers of Ust'-Kamenogorsk railcar demurrage was reduced by 20 percent over a two year period.

The socialist competition of railroad workers on the Tselinnaya Railroad, the Yuzhno-Ural'skaya Railroad and the Sverdlovskaya Railroad, the power industry workers of the Urals, Kazakh SSR, Siberia and the coal industry workers of Ekibastuz for speeding up coal shipments and improving the use of rolling stock have made it possible to ship 885,000 tons of coal in excess of the plan in 1981.

The 105 stations and 433 industrial enterprises that are working according to the experience of the Chelyabinsk transportation workers have managed to free more than 60,000 railcars for additional loading during the years 1980 through 1981; they have also used their own resources to repair some 16,000 railcars.

More than 140 enterprises on the Tselinnaya Railroad are working according to the experience of the collectives of railroad transport and industrial enterprises in L'vovskaya Oblast. More than half of these organizations are fulfilling their established norms for railcar demurrage. As a result, during the current year more than 7,000 railcars were made available for other shipping. The L'vov system is also being adopted on the Alma-Atinskaya and Zapadno-Kazakhstanskaya railroads.

The formation and passage through the sections of heavier and longer trains in the example of the Moscow railroad workers have been widely adopted on Kazakh SSR railroads. On the Tselinnaya Railroad they are using trains that weigh between 8,000 and 9,000 tons. Altogether during the first six months of this year more than 32,000 trains of an

increased weight were formed and driven on this railroad. These trains carried 21.4 million tons of freight in excess of the established weight norms.

Over the past two years some 215,000 trains were processed using the high-speed method on Kazakh SSR railroads.

At all of the large stations and junctions of the republic's railroads they have developed unified technological processes for the operation of a station and the industrial enterprises.

On the Tselinnaya Railroad they have achieved a high level of routing shipments. Some 75 percent of all freight is shipped in block trains. On the two other railroads the routing is used for nearly half of all dispatched freight. The experience of the Tselinnaya Railroad in routing national economic freight was demonstrated in 1982 at the Exhibition of Economic Achievements in Moscow.

On the Tselinnaya Railroad they have developed and adopted a technology for shipping coal and ore in circular routes. At present the 175 closed circular routes transport some 76 percent of all coal and ore. Electric power stations in the Urals, Siberia and the Kazakh SSR which are equipped with car dumpers receive all of their coal in these routes.

To reduce the amount of time required to process a local railcar on the Tselinnaya Railroad they have developed a new technology for the operation of the dispatch sectors. It requires the more efficient use of the carrying and throughput capacities of the sections and the processing capacity of the stations and the rational organization of freight work. The percentage of intermediate stations which participate in forming the shipping routes has risen. The adoption of the new technology has made it possible to reduce over the last three years the turnaround of a local railcar by some .76 of a 24-hour period.

In the course of a massive socialist competition the innovators of the Kazakh SSR railroads are making extensive use of new forms for organizing labor. The adoption at the Dzhambul locomotive depot on the Alma-Atinskaya Railroad of the brigade contract for the major periodic repair of a diesel locomotive has yielded significant savings. As a result labor productivity rose by 31 percent, wages increased by 19 percent, and there was a significant drop in the number of workers engaged in this type of locomotive repair work.

Good creative cooperation was established for railroad workers and transportation construction workers in speeding up the construction and introduction of railroad facilities that were under construction and in improving the efficiency of capital investments. Thus, for example, large projects for increasing the carrying and throughput capacities of the railroad lines were completed one year ahead of schedule. Transport construction workers and the collectives of the Kokchetav and Tselinograd departments for the construction of secondary tracks and the electrification of sections carrying large amounts of freight on the Tselinnaya Railroad are ahead of schedule in their work.

The innovators of industry are making a significant contribution to improving the operation of railroad transport. The movement "a personal creative plan for each engineer and technician", which is intended to further adopt new technology, to improve the technology of production processes, reduce manual labor, and to involve more railroad workers in the search for new methods, has become very popular.

Nearly 17,000 engineers and technicians on the Alma-Atinskaya Railroad are working according to their own personal creative plans. Over the first eight months of the year these proposals alone have led to savings of 2.4 million rubles.

Cooperation between the railroad workers and the scientific-research and railroad institutes have proven to be very fruitful. Research on the development of rational modes for operating the VL80T electric locomotives while pulling freight trains on the Karaganda-Tobolsk and Tselinograd-Ekibastuz sections is proving to be very effective. This work is being done by the Omsk Institute of the Engineers of Railroad Transport. Based upon recommendations of the institute the railroad is now developing mode charts for the pulling of trains.

A great deal of attention is being given to rationalizing cargo shipments. Within the republic and oblasts commissions have been created to coordinate the operation of all modes of transport and to rationalize shipments. As a result during the years of the 10th Five-Year Plan more than two million tons of freight have been switched from the railroad to other forms of transportation. In 1981, 720,000 tons of short-run and other irrational cargo shipments were dropped from the plans of shippers. While shipments of up to 50 kilometers were previously transferred to motor transport, now this distance has been increased to 100 to 150 km.

To reduce transportation costs work is being done to more rationally connect the recipients to the suppliers of product. This has made it possible to reduce regional freight traffic by 8.5 billion ton-kilometers and to save more than 24 million rubles.

A great deal of work in this direction is being done by the interdepartmental commission for the rationalization of freight shipments, which was created in 1981 under the Kazakh SSR Gosplan. This commission was given the job of reviewing problems having to do with rationalizing freight shipments, changing plans for connecting recipients to suppliers, increasing the routing of shipments, providing the optimal distribution of shipments between various modes of transportation, organizing direct and mixed railroad shipments, increasing the amount of transport work by trucks, river and pipeline systems. According to the recommendations of the commission in 1981 there was a change in the plan for the development and placement of enterprises for the production of prefabricated reinforced concrete, which made it possible to reduce the distance of shipping in cross hauling lines.

The commission has devised and is now accomplishing significant measures for rationalizing freight shipments for the current year. They call for improving the connection between recipients and suppliers for 28 different products, improving freight shipments in direct and mixed railroad and river transport, transferring shorthaul freight from the railroads to motor transport in an amount of 139,000 tons and river transport in an amount of 258,000 tons.

The steps that have been taken on the Tselinnaya Railroad for the more rational use of gondola cars have made it possible to free nearly 24,000 gondola cars in 1981; more than 10,000 gondola cars have been freed during this year. These gondola cars are needed to handle the growing number of coal and metal ore shipments.

The efficiency of using rolling stock depends largely upon the level of equipment rigging and the operation of the industrial railroad transport. The creation within the republic of nine unified railroad organizations, which service more than 200 enterprises, has proven itself.

These organizations need to be expanded. There is a critical need to create such organizations in another ten oblasts. In our opinion it is necessary to hasten the solution of the question having to do with transferring all large enterprises of industrial railroad transport into the domain of the USSR Ministry of the Railways.

The Pavlodar and Rudnenskoye industrial railroad transport enterprises are the best in the republic; at these organizations up to 90 percent of all operations are mechanized. By constantly improving the technology of the work and strengthening the interaction with the adjacent stations railcar demurrage on the tracks is steadily declining. At the present time demurrage at the Rudnenskoye enterprise is below the norm at .31 hours; at the Pavlodar enterprise this figure is .99 hours. During the first half of 1982 nearly 400 railcars have been saved.

Due to the total support and help of the party and local soviet organs, the Kazakh SSR railroads are functioning on a more stable basis in recent years. The Tselinnaya Railroad has been awarded the Labor Red Banner for the successes it has achieved in fulfilling plan assignments of the 10th Five-Year Plan in transporting national economic freight and passengers and in providing high technical-economic indicators of work.

The collective of the Zapadno-Kazakhstanskaya Railroad has achieved high indicators. Work results for 1981 have made it possible for the railroad to win the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Trade Union Council, and the Komsomol Central Committee. The railroad has also been listed on the all-union honor roll of the USSR Exhibition of Economic Achievements in Moscow.

The Aktyubinsk, Pavlodar, and Chimkent railroad lines emerged as the winners in the republic socialist competition for 1981.

However, there are still shortcomings in the Kazakh SSR's railroads. Plan assignments for several quantitative indicators are not being met; the demand for freight shipments is not always being satisfied; and on several sections the technical condition of diesel locomotives and track maintenance remains at a low level. And plans for the construction of many facilities are not being fulfilled.

The attention of the labor collectives of the railroads, their party, trade union and Komsomol organizations is being directed at rapidly eliminating these "bottlenecks" and at ensuring the stable operation of each enterprise for fulfilling plan assignments. They are also seeking to fully and on a timely basis meet the needs of the national economy and the population for shipping capacity and increasing the efficiency and quality of work.

On the Tselinnaya Railroad a socialist competition is well underway to fulfill the two-year assignment of the 11th Five-Year Plan ahead of schedule - by the 60th anniversary of the formation of the USSR. The collectives of 102 enterprises, 8,200 brigades, shops, shifts, sectors, and more than 35,000 leading workers and innovators of production are actively participating in this competition. The workers of the Atbasar locomotive depot have pledged to operate 8,000 heavy trains and 50 trains on fuel that has been conserved prior to the anniversary. The workers at the Zhelezorudnaya railroad station on the Kustanay department are meeting their pledges. Everyday they are overfulfilling their assignments for the loading and unloading of freight.

V.D. Rotov, an electric locomotive operator at the Tselinograd locomotive depot and a delegate to the 17th Trade Union Congress, has decided to conserve 2,000 kW-hours of electricity prior to the 60th anniversary. The leading machine operator has already conserved more than 3,000 kW-hours and regularly fulfills assignments for technical speed. V. S. Smailov, a diesel locomotive operator at the Tselinograd depot, is doing an outstanding job.

At the railcar depot in Pavlodar, a brigade from the depot repair shop which is headed up by senior foreman A. Ye. Demchenko, has pledged to release more than 1,800 railcars from the repair shop prior to the anniversary. These pledges are being met.

Some 85 enterprises, 575 shops, and 552 brigades are working successfully on the Zapadno-Kazakhstanskaya Railroad. These are the Chelkarskaya signaling and communications section, the Kazalinskoye locomotive depot, and others.

✓ While actively participating in the all-unionⁿ socialist competition to provide a worthy response to this important date in the life of the Soviet Union and the entire Soviet people, the workers of Kazakh SSR's railroad transportation are steadily managing to raise the efficiency of transportation service to the national economy and the population. In addition, they are fulfilling the extensive program for the economic and social development of the USSR, which was promulgated by the 26th CPSU Congress.

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OCEAN AND RIVER

COOPERATION IN SHIPBUILDING AMONG CEMA MEMBERS, YUGOSLAVIA

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 4, 1982 pp 36-40

[Article by Yevgeniy Solodov, CEMA Secretariat]

[Text] Economic and scientific and technical cooperation in shipbuilding among CEMA members and the SFRY for 1976-1980 was accomplished according to the Complex program and on the basis of documents approved by the Permanent Committee of CEMA for Cooperation in Machine Building and signed in Moscow by the representatives of eight countries (Peoples Republic of Bulgaria, Hungarian Peoples Republic, GDR, Polish Peoples Republic, Socialist Republic of Rumania, USSR, CSSR and SFRY):

on 12 December 1975, protocols were signed on extension of two agreements on multilateral international specialization and cooperation in production of ships and ship makeup equipment (on 9 June 1972 with regard to maritime vessels and inland navigation ships for 1972-1975 and on 17 October 1972 with regard to ship makeup equipment for 1973-1975);

on 13 December, an agreement was signed on multilateral international cooperation in conducting scientific and technical research (NIT) and experimental and design work (OKR).

The agreement of 12 December 1975 provided for mutual deliveries during 1976-1980 of 1,396 ships and barges. They actually comprised 1,501 vessels, including 142 for the Peoples Republic of Bulgaria, 134 for the Hungarian Peoples Republic, 199 for the GDR, 351 for the Polish Peoples Republic, 55 for the Socialist Republic of Rumania, 456 for the USSR, 123 for the CSSR and 41 for the SFRY.

The approximate fraction of countries in joint export of ships and barges is equal to 8.6 percent for the Peoples Republic of Bulgaria, 4.6 percent for the Hungarian Peoples Republic, 37.1 percent for the GDR, 27.1 percent for the Polish Peoples Republic, 3.4 percent for the Socialist Republic of Rumania, 4.8 percent for the USSR, 5.3 percent for the CSSR and 9.1 percent for the SFRY.

Scientific and technical cooperation had an appreciable effect on development of shipbuilding among CEMA members and the SFRY. This contributed to

development of new progressive and competitive ships and ship makeup equipment and to an increase of the technical level and quality of the mutually delivered products.

Implementation of the NTI and OKR program during 1976-1980 made it possible to develop and introduce high-performance production processes in ship construction, the modular (zonal) method of assembly of mechanisms and shaping of small ship hulls from glass fiber-reinforced plastics. It made it possible to prepare recommendations to reduce specific fuel consumption by ship power plants and to develop the preliminary designs for wire (single-drum) and cable hoists for large-capacity trawlers using a number of original design solutions.

Continuous stable growth of productive capacities, high-quality changes in the structure of the sector, development of specialization and standardization of ships and barges of different classes and designations, coordinated actions in NTI and OKR and further improvement of the forms and methods of organization, planning and implementation of the results of mutually advantageous economic and scientific and technical ties were typical during the past five-year plan for cooperation among CEMA members and the SFRY.

The development of highly effective forms of cooperation, specifically of multilateral specialization of production, made it possible for CEMA members and the SFRY to increase mutual deliveries of ships and barges more than 1.6-fold during 1976-1980 compared to the previous five-year plan.

Participation in the international socialist division of labor permitted CEMA members and the SFRY to increase the volumes of shipbuilding product output from year to year (the greatest growth dynamics was observed in the Socialist Republic of Rumania and the Peoples Republic of Bulgaria). This specific weight of the maritime fleet in cargo turnover of all types of transport increased continuously. The fraction of CEMA members and the SFRY in the total volume of the worldwide shipbuilding industry increased significantly. This became possible with regard to the reconstruction and modernization of shipyards and of the scientific base and also intensification of labor in these countries. The most thorough measures were implemented in the Socialist Republic of Rumania, the Polish Peoples Republic and the Peoples Republic of Bulgaria.

Because of this, large-capacity and technically more complex classes of ships are being constructed, for example, in the shipyards of the Socialist Republic of Rumania: tankers with deadweight of 150,000 tons, bulk carriers with deadweight of 55,000 tons, roll on-roll off ships and the floating drilling rig "Gloria."

The Peoples Republic of Bulgaria began to produce tankers with deadweight of 100,000 tons and in the future plans to construct product carriers-tankers with deadweight of 25,000 tons, large container carriers and so on.

The exports of the Polish Shipbuilding Industry increased by 80 percent during 1976-1980. As a result the Polish Peoples Republic occupied third place worldwide in export of ships after Japan and Sweden and seventh place in shipbuilding.

A complex program for making shipbuilding more efficient was implemented successfully in the GDR. Main attention was devoted to improvement of the technology, production of technological equipment and reduction of ship construction deadlines.

Work was carried out at the shipyards of the CSSR to improve welding production.

The Hungarian Shipyard and Crane-Building Plant began modernization of the leading sections for a twofold increase of capacities in tugboat and floating crane output mainly for deliveries to cooperating countries.

Along with reconstruction of practically all the leading shipyards of the Yadranski Brod Association carried out in the early 1970s, the hull-shaping yards in the SFRY were improved.

The necessity of meeting the needs of the national economy of CEMA members and the SFRY in ships of different classes and designations through their own production and mutual exports was one of the prerequisites for rapid development of the scientific and experimental base of the sector during the past decade.

Successful implementation of the Complex program made it possible to advance new tasks of long-term cooperation, specifically in shipbuilding.

The DTsPS [not further identified] for energy, fuel and raw material and for development of transport communications of CEMA members were adopted at the 32nd and 33rd sessions of the CEMA conference. The subprograms provided in them to support the planned measures with machines and equipment are directed toward intensification and expansion of specialization and cooperation of production, expansion of scientific and technical cooperation to develop new and to improve existing water transport facilities and to develop commercial barges to study the natural resources of the continental shelf and the world ocean.

The Permanent Committee of CEMA for Cooperation in Machine Building was developed to implement the measures of the DTsPS for transport and the representatives of the contracting parties from the Peoples Republic of Bulgaria, the Hungarian Peoples Republic, the GDR, the Polish Peoples Republic, the Socialist Republic of Rumania, the USSR, the CSSR and the SFRY signed two agreements on 11 March 1981:

on multilateral specialization in production of maritime vessels, internal navigation vessels and barges for 1981-1985;

on multilateral specialization and cooperation in production of ship makeup equipment, its assemblies and parts for the same period.

The first of them provides for output of a coordinated nomenclature of 179 groups of standard dimensions of products compared to 137 groups contained in the previously existing agreement.

The nomenclature includes new class ships and barges for combination shipment of mass piece and bulk goods, gas carriers for natural gas delivery, auxiliary vessels for the fishing fleet, floating docks, hopper barges, non-self-propelled dry-cargo vessels and tankers and superstructure modules for stationary bases of marine platforms. Some classes of specialized vessels have been supplemented with new groups.

The increase in the number of specialized products during 1981-1985 compared to 1976-1980 will comprise 19 groups for maritime transport vessels, three groups for fishing vessels, 13 groups for maritime ships of the commercial fleet (including vessels for development of the shelf), six groups for transport vessels of inland waterways and two groups for vessels of the commercial fleet of inland waterways.

Concentration of production by the new agreement is characterized by the following data: one country will specialize in construction of 38 groups of ships (1.5-fold greater than in 1976-1980, which comprises more than 20 percent of the total specialized production), two countries will specialize in 37 groups, three countries will specialize in 40 groups and more than three countries will specialize in 53 groups of ships.

The volumes of mutual deliveries of ships during 1981-1985 will increase by approximately 30 percent compared to the previous five-year plan.

Scientific and technical cooperation will be implemented according to the agreement concluded on the recommendation of the Permanent Committee of CEMA for Cooperation in Machine Building on 23 May 1980, which provides for:

- forecasting research to determine methods of developing shipbuilding science and technology;

- design and development of promising ships, investigation of their hydrodynamic characteristics and propulsive qualities and study of individual problems of the strength of hull designs;

- development of shipboard equipment, mechanisms, systems and devices (including a guarantee of environmental protection) with improved technical and economic indicators;

- improvement of the technology of shipbuilding, including construction from nontraditional materials (plastics, aluminum alloys, reinforced concrete and so on) and the use of new materials.

Analyses and forecasts of the technical development of the sector, determination of promising classes of ships and execution of their design developments occupy an important position in cooperation among CEMA members and the SFRY in shipbuilding.

The forecast for 1981-1990 has now been worked out according to the plan of operations and preparatory work is being conducted to intensify specialization of ship and barge production for 1986-1990.

Based on the characteristic features for development of maritime cargo shipments during the next five-year plan and taking into account the composition of the fleet of CEMA members and the SFRY, one can suggest significant expansion of shipbuilding for shipment of consolidated cargoes, specialized by the type of ship cargo, ships for operation in the Arctic and also cruise ships and ferries. It is difficult to anticipate an appreciable increase in the speed of most classes of ships due to the increase of fuel prices during the predicted period.

Further improvements of the power plants and makeup equipment and an increase of their reliability and economy are planned. Environmental protection will be supported to the maximum degree possible. The volume of automation of shipboard processes, primarily of ship navigation, will be increased. Watchless servicing of the engine room will become a daily occurrence.

Despite the intensive development of dry-cargo vessels for shipment in consolidated lots (container carriers, ro-ro classes, lighter carriers and so on), the worldwide fleet of these vessels will retain relative stability of growth rates during the forecasting period.

Vessels with deadweight from 5,000 to 10,000 tons and from 14,000 to 22,000 tons (specifically, from 16,000 to 18,000 tons) have the best prospects. The most probable speed will be 15-17 knots.

Construction of universal dry-cargo vessels with average speed of 13-18 knots (mainly using small- and medium-speed diesels) of 20 classes, including three classes (with deadweight from 3,500 to 15,000 tons) in the Peoples Republic of Bulgaria, one class (of the lo ro class rated at 20,000 tons) in the GDR, five classes (from 6,300 to 19,500 tons) in the Polish Peoples Republic, four classes (from 5,500 to 25,000-30,000 tons) in the USSR and four classes (including three multipurpose classes with deadweight of 10,000, 16,000-17,000 and 25,000 tons and one lo-ro class with deadweight of 12,000 tons) in the SFRY is planned in CEMA countries and the SFRY during 1986-1990.

Despite the annually increasing competition in worldwide maritime transport, the demand for refrigerated vessels, which now comprise approximately 15 percent of the tonnage of the worldwide transport fleet, is continuously increasing and will be increased during the forecasting period. Their deadweight will increase from 11.5 to 14.5 million tons from 1980 to 1990.

Specialization in construction of refrigerated ships during 1986-1990 will be provided by three countries: four classes (with hold capacity of 2,000, 7,500, 11,000 and 15,000 m³) in the Polish Peoples Republic, two classes (5,000 and 20,000 m³) in the Socialist Republic of Rumania and one class (with hold capacity of 14,000 m³) in the SFRY.

Analysis of the trends in development of container vessels, which now comprise more than 11 percent of the worldwide fleet of transport vessels assumes a stable growth of them in the future. The Peoples Republic of Bulgaria plans construction of these vessels with capacity of more than 400 containers, the GDR plans construction of vessels with capacity of 800-1,200 containers and

the Polish Peoples Republic plans construction of vessels with capacity of 580, 1,400 and 2,900 containers.

Accelerated development of roll on-roll off ships (of the ro-ro class) is continuing. The GDR will specialize in vessels with capacity of 8,000-1,5000 m³, the Socialist Republic of Rumania will specialize in vessels with capacity of 12,000 and 30,000, the USSR will specialize in vessels with capacity of 20,000 and 55,000 m³, the SFRY will specialize in vessels with capacity of 20,000 m³ and so on.

Construction of lighter carriers of two classes (maritime for transport of lighters between large ports and feeder lighters for transport of small barges on short lines), begun during the 1970s, is in the initial stages. In this regard only three countries are forecasting construction of lighter carriers: the Socialist Republic of Rumania with carriers having capacity of approximately 50 lighters, the SFRY with capacity of 80 lighters and the USSR with carriers having capacity of approximately 80 lighters (for installation on the icebreaker-transport lighter-container carrier).

Construction of bulk cargo vessels and tankers, which now comprise 22 percent of the worldwide transport fleet in deadweight, will be continued. The Peoples Republic of Bulgaria plans to specialize in four classes (with deadweight of 10,000-12,000 tons, 25,000 tons, 30,000 tons or more and 60,000 tons), the Socialist Republic of Rumania will specialize in five classes (with deadweight from 8,000 to 150,000 tons) and the SFRY will specialize in two classes (with deadweight of 29,700 and 70,000 tons).

Based on the portfolio of orders, multipurpose dry-cargo vessels (for transport of large piece goods and bulk cargo and containers) will achieve further development in the future. These vessels will be produced by two CEMA members: the Polish Peoples Republic will produce six classes (with deadweight from 3,200 to 59,000 tons) and the Socialist Republic of Rumania will produce one class (with deadweight of 50,000 tons).

The total deadweight of the worldwide oil tanker fleet will reach 330 million tons by 1980 and will be stabilized at this level. It is expected that the tonnage will again increase by the end of the century.

The deadweight of the most widely used large-capacity ships, designed to transport crude oil, will probably not exceed 300,000 tons in the future, while the deadweight of tankers and product carriers will increase and will comprise 50,000-80,000 tons for the main group of vessels. It will reach 150,000-200,000 tons by the end of the forecasting period. Tanker speeds will have a tendency toward some decrease with regard to the increase of fuel costs.

Five CEMA members and the SFRY plan to construct 18 types of tankers in the future: the Peoples Republic of Bulgaria will build five classes (with deadweight from 3,000 to 60,000 tons), the Polish Peoples Republic will build five classes (from 15,500 to 83,000 tons), the Socialist Republic of Rumania will build five classes (from 2,000 to 160,000 tons), the USSR will build two classes (25,000 and 65,000 tons) and the SFRY will build two classes (with deadweight of 45,000 and 65,000 tons).

Shipbuilding for transport of liquefied gases, chemicals and other specific bulk cargo will increase throughout the world from 1980 through 2000. An appreciable increase of the tonnage of gas carriers for transport of natural gas and ammonia is not envisioned in CEMA countries due to the intensive growth of pipeline transport.

Such factors as introduction of 200-mile economic zones by coastal states, an increase of fish and petroleum product production at great depths, development of the fishing industry of the polar regions of the world ocean, an increase of squid and Antarctic krill production and so on will significantly affect the development of the fishing fleet in the future.

Construction of 32 classes of vessels for the fishing fleet (refrigerated catching and transport vessels and factory ships) is forecast in CEMA members during 1986-1990 with regard to these and other factors: four classes, including two classes of medium- and large-capacity refrigerated catching and processing vessels and two classes of refrigerated transport vessels in the GDR, 12 classes, including four classes of universal trawlers, two classes of factory trawlers, two classes of universal fishing bases, three classes of refrigerated transport vessels and one class of ship for transport of salted fish in the Polish Peoples Republic, three classes, including one class of a multipurpose fishing ship, in the Socialist Republic of Rumania and 15 classes, including 12 classes of fishing and freezer vessels and squid- and shrimp-catching vessels and also krill-catching and processing vessels, one class of fishing base and two classes of refrigerated transport vessels in the USSR.

Problems of economic and scientific and technical cooperation in the future will occupy an important position in the activity of section 4 (in shipbuilding) by the Permanent Committee of CEMA for Cooperation in Machine Building.

Based on the fact that the agreement (treaty) signed earlier plays a significant role in development and intensification of the division of labor in the sector, the possibility and feasibility of preparing a draft of a treaty on multilateral specialization of ship and barge production for a 10-year period (1986-1995) are now being considered. This requires both more extensive study of the trends in development of worldwide shipbuilding up to 2000 and consideration of the growth of the productive capacities of CEMA members and the SFRY in shipbuilding in the near future.

Working out the treaty will contribute to further expansion and intensification of cooperation by CEMA members and the SFRY in development of new and improvement of existing water transport equipment, fishing fleet vessels and commercial barges and will give a more stable and longer term nature to pledges of mutual deliveries.

PHOTO CAPTIONS

1. p. 37. Universal dry-cargo vessel of "Dnepr" class.
2. p. 38. Roll on-roll off ship of the "Atlantika" class (top).
3. p. 38. Hydrofoil passenger ship of "Voskhod-2" class (bottom).

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OCEAN AND RIVER

CONVERSION OF DRY-CARGO SHIPS INTO CONTAINER CARRIERS

Moscow MORSKOY FLOT in Russian No 10, Oct 82 pp 38-40

[Article by A. Pilipenko, chief engineer of the Far East Steamship Company, and M. Smolyakov, director of a group for the supervision of the building of ships: "Dry-Cargo Ships Into Container Carriers"]

[Text] The modernization of the fleet as a reserve of production--these questions were raised in the article of B. Roginskiy et al. (MORSKOY FLOT, No 10, 1980)--is being used extensively in the Far East Steamship Company. Thus, from May 1979 to February 1980 four dry-cargo ships of the "Pula" class were converted into specialized container carriers by the (Jurong) Shipyard (Singapore). The conversion was carried out for the class of the USSR Registry "KM Container Carrier" in accordance with the plan approved by Lloyd's Registry. The technical supervision of the conversion was carried out by a supervisory group of the Far East Steamship Company and by Lloyd's Registry.

As a result of conversion the specifications of the ship changed (table).

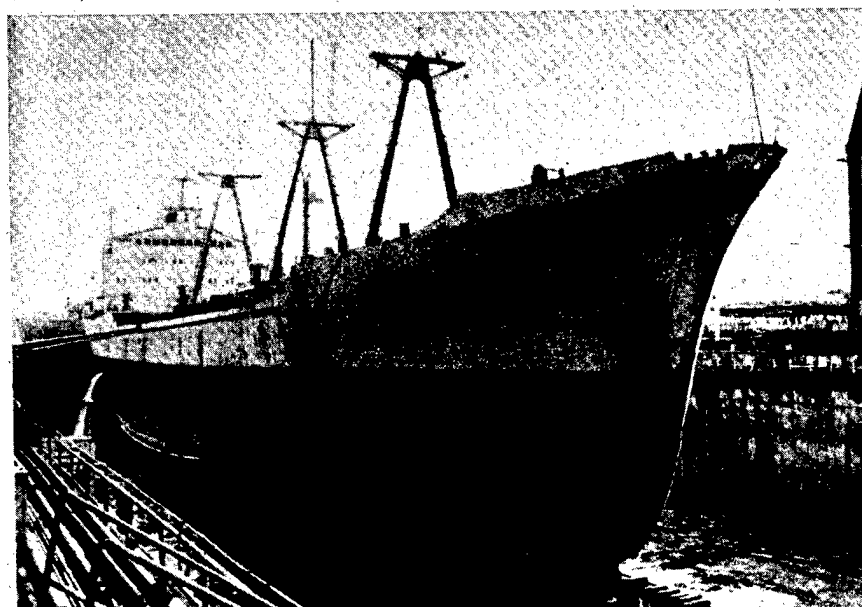
<u>Characteristic of ship</u>	<u>Before con- version</u>	<u>After con- version</u>
Length, m:		
overall.	159.42	176.42
gauge.	148.38	165.18
Midship beam, m.	21.25	21.25
Depth, m	12.60	12.60
Summer draft, m.	9.68	9.80
Gross tonnage, registered tons	10457	12273
Deadweight, tons	14380	15203
Container capacity, units:		
in cargo holds	--	424
on deck.	--	280*

[Table continued on following page]

* Including 80 refrigerator containers.

<u>Characteristic of ship</u>	<u>Before con- version</u>	<u>After con- version</u>
Ship capacities, tons:		
heavy fuel.	1830	2363+1000*
diesel fuel	225	225
fresh water	149	149
Water ballast, tons	1305	2900-1000*
Fuel consumption, tons/day.	42	42
Cruising range, miles	15700	29000
Loaded speed, knots	18.2	17.8
Class of ship	KM LZ	KM container carrier

*Capacity of replaceable (fuel-ballast) tanks.



Ship Before Conversion

There is envisaged by the plan of the conversion of the ship the increase of its length by 16.8 m by the installation of a middlebody in the midsection of the ship. The upper deck of the ship to the bow from the front bulkhead of the superstructure was completely replaced, in this case all the deck houses, gear and rigging on the upper deck were dismantled. New covers and coamings of the cargo holds were fitted. The new transverse bulkheads are double, of a strengthened rigid design; their positioning was brought in line with the necessary length of the container

holds. In connection with the unusually wide opening of the deck (about 86 percent of the breadth of the ship) for the assurance of the overall strength of the ship and the torsional rigidity of the hull, and at the same time with the economic advisability of retaining the existing dimensions of the plating and framing of the hull the considerable increase of the sizes of the newly installed strength members was envisaged: a deck stringer 38 mm thick, while in the area of the 66th-135th frames longitudinal bulkheads (of the portside and starboard), which separate the new onboard fuel deep tanks, were installed under the hatch-side coamings over the full height of the hull. The cargo holds have been completely fitted out for carrying 20- and 40-foot containers on five layers, while the covers of the new cargo holds have been adapted for carrying containers in three layers.

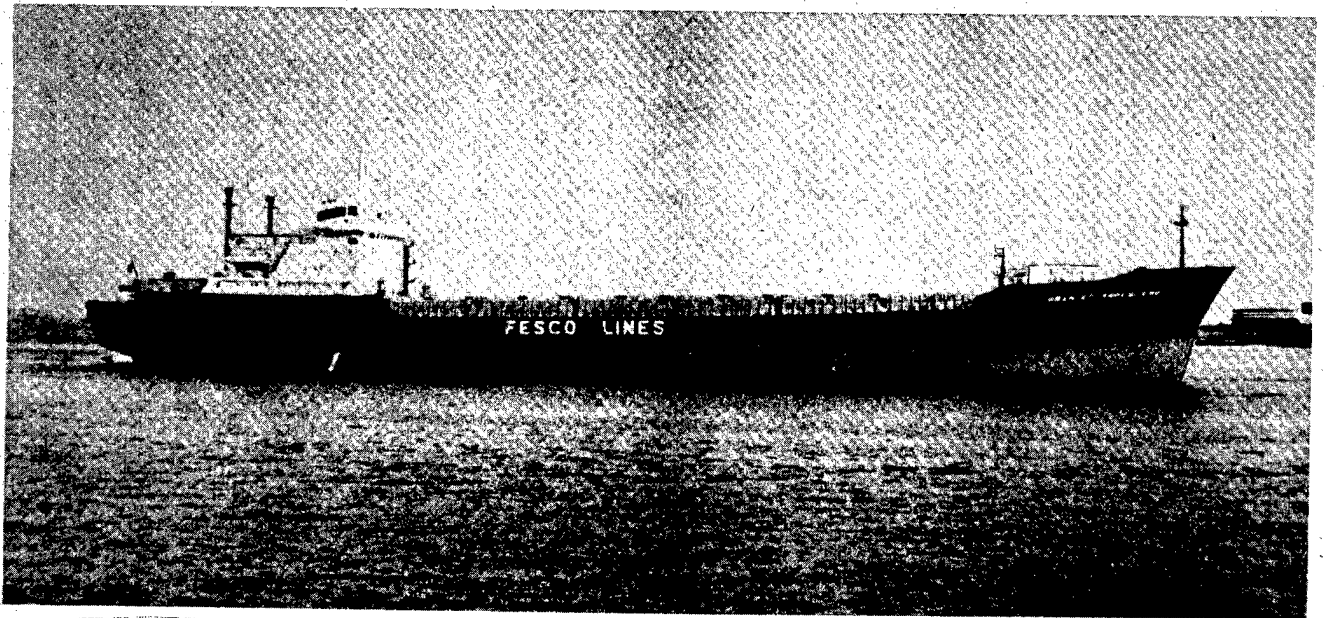
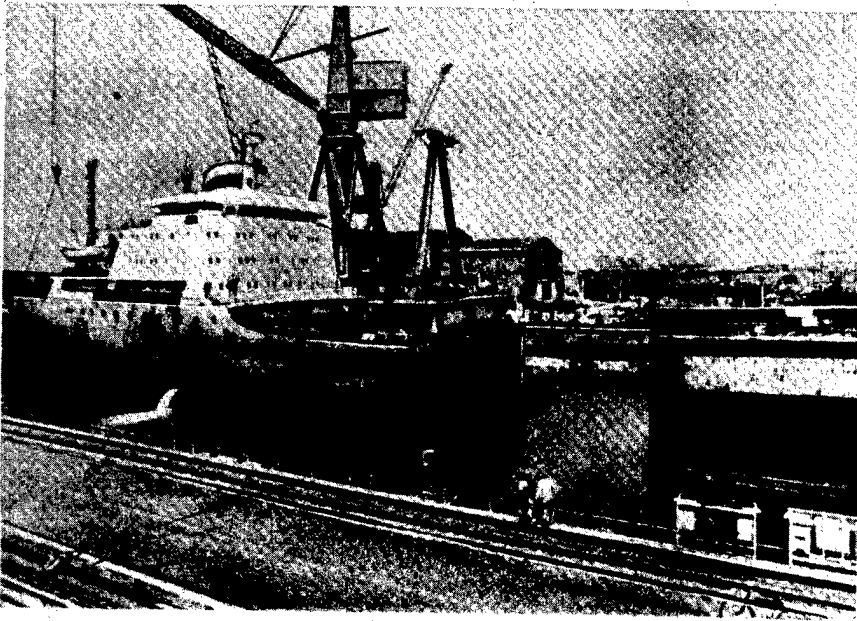
The ship gear was retained without changes, with the exception of the lifting gear, which was completely dismantled, while two cargo booms on the stern sections (of the existing ones) were modified and adapted for use when loading provisions, supplies and spare parts into the engine room.

There was envisaged by the technology of the work on assembly of the new hull of the ship the division of the ship into two sections (at the 94th frame), when the ship was in dry dock, after which the dock was partially filled, ensuring the floating of the bow section of the ship and its movement into the new position. When the dock was drained they set the bow section of the hull in cribbings in the new position and began the assembly of the panels of the midsection of the hull. The assembly of the deck panels, bulkheads and onboard deep tanks, as well as the fastening of the couplings of the hull, the installation of new couplings and local reinforcements and the joining of the pipes, which were installed in the panel at the shop, were carried out at the same time. Upon completion of the hull work the installation of the coamings of the cargo hatches, which were pre-assembled and checked on a bench, and the equipment of the cargo holds, the installation of the masts, the wave baffle, the stairways, platforms and other equipment and the pouring of the solid ballast were begun. Then the tightening of the cable routings and the installation of the electrical equipment were carried out. As a whole the conversion of one ship lasted about 90 days.

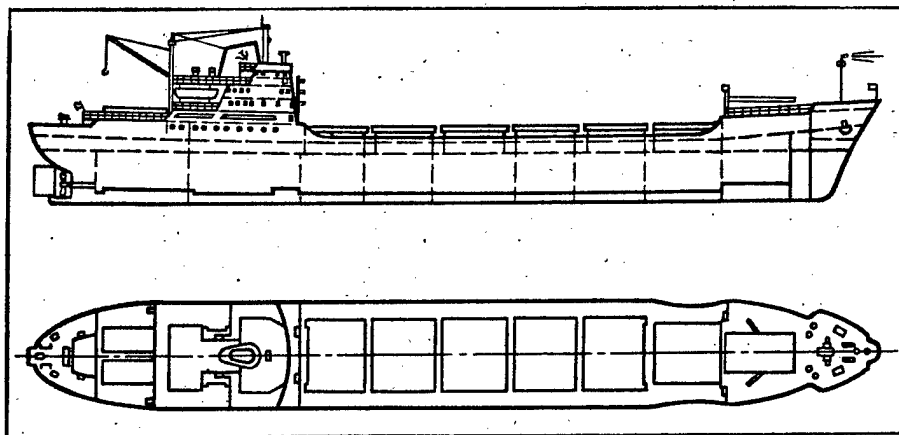
When elaborating the plan, as well as in the process of its implementation, the most serious attention was devoted to the questions of the strength, stability and unsinkability of the new ship. The overall longitudinal torsional strength and rigidity of the hull of the ship were calculated according to the methods cited in Lloyd's Regulations. In order to increase the section modulus to the value required by Lloyd's Regulations, the increase of the thickness of the deck stringer to 38 mm, the installation of longitudinal bulkheads (which are the boundaries of the cargo holds) also 38 mm thick and of 40-mm thick horizontal reinforcing ribs of the longitudinal bulkheads were required.

The local strengthening of the double bottom at the points of the supports of the containers is ensured by the installation of steel I-beams 500 mm high and with a breadth of the flanges of 500 mm. The floors at the points of installation of the beams were accordingly reinforced.

The ship is divided into two sections at the 94th frame and the bow section is shifted by the length of the middlebody



The Converted Ship



Structural Diagram of the Converted Ship

New hatch coamings of a strong design, 1.5-2.3 m high and 12 mm thick with the installation of the stays at a distance of not more than 1.6 m were made. The largest dimensions of the cargo holds are 18.6X12.8 m. The necessary radius of the rounding off of the angles of the cut-outs of the cargo holds were maintained in accordance with Lloyd's Regulations and were executed in design in the special below-deck lockers of strong design, which were located beyond the clearance of the cargo hold. The covers of the cargo holds are of the pontoon type, measure 9.5X13 m, there are two per hatch (starboard and portside). The tightness of the covers is ensured by a rubber seal; the covers are fastened by bolt bars. The removal and mounting of the covers are carried out by the loading equipment of the container terminal by means of specially equipped clamps, in this case the removed covers can be stacked on the neighboring ones with the installation of removable spacers.

Additional reinforcements were required under the poop deck at the points of the installation of the hatch-side coamings (which are intended for the placement on them of two layers of containers), as well as at the points of the installation of the signal mast, the wave baffle and the fixed structures for access to the top layers of the deck containers.

The stability of the ship meets the demands of the USSR Registry, which are made on container carriers. However, the pouring of an additional 2,960 tons of solid ballast, which consists of a mixture of concrete, gravel and scrap metal and was placed in the cargo holds in the second bottom and in the bulkheads of the onboard tanks, as well as in the double-bottom space in the central ballast tank, was required in order to bring the stability up to the prevailing norms. The ballast made it possible (with respect to the stability) to take on containers with an average weight of 20 tons in the holds and 10 tons on the covers of the cargo holds.

Moreover, in connection with the unusually low freeboard for the container carrier another problem arose: the static stability curve was limited with respect to the flooding angle (about 50°) and the criterion of stability with respect to the angle of vanishing stability in accordance with the Regulations of the USSR Registry were not maintained. This led to the need to replace the three bow wooden doors of the superstructure on the boat deck with metal, watertight doors.

For the purpose of monitoring the initial stability during loading and on departure, as well as for equalizing the list during loading an axial-flow standby heeling pump with a capacity of 250 m³/hr was installed in the area of the 9th-11th frames between the transverse bulkheads in the second bottom. The pump is under remote control from the bridge, the pump ensures the transfer from side to side of ballast in the No 4 tanks of the starboard and portside. The initial metacentric height is calculated according to special nomograms, on the basis of the displacement and amount of ballast, which it is necessary to transfer to give the ship a heeling angle of 2°.

Because of the construction the single-compartment floodability of the ship was ensured with a freeboard of not less than 2,928 mm. Since the ship was operated with a minimum freeboard of 2,621 mm, in the symbol of the class of the USSR Registry the mark of unsinkability was retained with the provision of a freeboard of 2,928 mm. After conversion the freeboard of the ship was established to be equal to 2,800 mm. The follow-up calculation of the unsinkability of the new ship showed that the ship in the case of the flooding of any one compartment meets the demands on its damaged stability with respect to the margin line and the static stability curve in damaged condition. However, in the case of unsymmetrical flooding (a hole in the area of the onboard deep tank) the heeling angle of the ship before righting came to about 22°, which exceeds the limit stipulated by the Regulations of the USSR Registry, therefore the mark of unsinkability was removed from the symbol of the class of the ship.

Considerable difficulties arose with the provision of the necessary passageways on the deck, as well as the location of various equipment for the fastening of the containers, the panels and sockets of the power supply of the refrigerator containers, the air-measuring pipes, the ventilation heads and so forth. For the provision of the necessary passageways on the upper deck along the sides the bulwarks, which were initially called for by the plan, had to be replaced by a guard rail, and the design of its stanchions had to be executed without struts, owing to the lengthening of the longitudinal brackets which were welded to the deck stringer. The large equipment for the fastening of the deck containers (lashings, turn-buckles) was positioned on the hatch-side coamings on special brackets; the small equipment (jaws, clamps) was placed in boxes on the platforms between the holds. The heads of the air and measuring pipes, the ventilation, as well as the sockets of the power supply of the refrigerator containers are located under the platforms (between the hatch-end coamings). The panels of the power supply of the refrigerator containers are located in a special compartment under the upper deck in the space between the transverse bulkheads. Since the conversion of the ships into cellular container carriers they have run on various routes. The experience of their use in container transportation has confirmed the correctness of the engineering decisions which were used during the conversion.

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MISCELLANEOUS

TRANSPORTATION DEVELOPMENT AMONG CEMA MEMBERS

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 4, 1982
pp 17-22

[Article by Ryshard Stavrovski, head of transport department of CEMA Secretariat]

[Text] Transport, the main task of which is timely and efficient satisfaction of the needs of the national economy and of the population in shipments, plays an important role in cooperation of CEMA members. These tasks were mainly fulfilled successfully during 1976-1980.

The total volume of freight shipments by all types of general-purpose transport of CEMA members reached 15.3 billion tons in 1980, having increased by 14 percent compared to 1975. Accordingly, the freight turnover comprised 6.9 trillion ton-kilometers, i.e., its increase reached 18 percent. Passenger shipments also continued to develop. The passenger turnover of all types of general-purpose transport increased by 17.2 percent in 1980 compared to 1975.

The main type of transport, as before, is rail transport in most CEMA member countries, although its specific weight in the total volume of transport shipments is decreasing systematically. The fraction of rail transport in the total volume of freight turnover decreased from 61.2 to 55.2 percent during the last five-year plan. A total of 5.3 billion tons of freight was shipped by rail transport in 1980, or 5 percent more than in 1975. Accordingly, freight turnover increased by 6 percent and comprised 3.810 billion ton-kilometers in 1980. During this period, CEMA members carried out work to modernize the rail system and to convert the railroads to progressive types of traction--electric and diesel locomotives. In 1981 the total length of electrified railroads of CEMA members reached 59,000 km compared to 53,000 km in 1975. The fraction of electrified lines in the total operated length of rail lines of CEMA members increased from 23.7 percent in 1975 to 26 percent in 1980.

All other types of transport exceed general-purpose motor transport by the volume of freight shipped. In 1980, the fraction of motor transport was approximately 54 percent of freight shipped by all types of transport of CEMA members and it reached 8.2 billion tons in absolute expression and increased by 19 percent compared to 1975. The freight turnover comprised 194 billion ton-kilometers and increased by 36 percent, while its specific weight in the total freight turnover reached 2.8 percent. The growth of the volume of

operations in motor transport became possible with regard to development of the highway system of CEMA members. In 1980 their length comprised approximately 2 million km, of which 60 percent were paved.

Maritime transport, the specific weight of which occupies 20.2 percent in the total freight turnover, plays an important role in the transport system of CEMA members. Freight shipments by the marine transport of CEMA members comprised 334 million tons in 1980 and the cargo turnover comprised 1.394 billion ton-kilometers. Cargo shipments increased by 20 percent and cargo turnover increased by 16 percent compared to 1975.

River transport also continued to develop during the period under consideration. In 1980, 637 million tons of cargo was shipped by this type of transport in the fraternal countries or 24 percent more than in 1975. The cargo turnover increased by 11 percent compared to 1975 and reached 259 billion ton-kilometers. The specific weight of river transport in the total volume of cargo shipments comprised 4.1 percent in 1980, while the specific weight of the cargo turnover comprised 3.8 percent.

The airline network of CEMA members was expanded considerably during the past five-year plan, while the total volume of cargo shipments by air transport reached 3.1 million tons in 1980. The cargo turnover comprised 3.4 billion ton-kilometers, i.e., 20 percent more than in 1975.

An increase of oil and petroleum product consumption by CEMA members induced the development of oil pipeline transport and an increase of its operation. In 1980, 775 million tons of oil and petroleum products were pumped through the oil pipelines of CEMA members, or 28 percent more than in 1975. Compared to 1975, the freight transport increased by 79 percent and comprised 1.239 billion ton-kilometers. Its specific weight in the total freight turnover of all types of transport from 11.9 percent in 1975 to 18.0 percent in 1980.

The operation of the individual types of transport in our fraternal states affects the total results of the transport activity of CEMA members. Let us dwell in this regard on the most significant achievements of a number of CEMA members in development of transport during the previous period.

Reconstruction and modernization of the main rail lines was continued in the Peoples Republic of Bulgaria, while the specific weight of lines having double tracking increased from 6 percent in 1975 to 14 percent in 1980, while electric traction was increased to 45 percent. The specific weight of electrified lines in the total operational length of rail lines comprised 34.4 percent in 1980 compared to 26.4 percent in 1975. The travel speed of trains increased from 60 to 80 km/hr.

Approximately 500 km of first and second category highways were reconstructed and constructed in the Peoples Republic of Bulgaria to guarantee complex development and reconstruction of international main highways. The International Navigable Management Enterprise Interlikhter and the Bulgarian-Soviet Transport Societies Dunaytrans and Intermorput' were created in water transport. The

largest transport facility of the 7th Five-Year Plan of the Peoples Republic of Bulgaria, born of integration and fraternal friendship with the USSR--the Varna-Il'ichevsk ferry complex, was constructed.

The transport of the Hungarian Peoples Republic shipped 388 million tons of goods in 1980, or 12 percent more than in 1975. The freight turnover of all types of transport was increased by 22 percent. More than half of the freight turnover of the Hungarian Peoples Republic is related to international shipments, which increased by 31 percent during the previous period. Internal shipments were increased by 11 percent. During 1976-1980, a total of 1,722 km of railroad tracks was modernized and 314 km of tracks were electrified. The specific weight of modern traction increased from 90 percent in 1975 to 96 percent in 1980. The total capacity of trucks and trailers increased by 24 percent during five years in motor transport. Changes occurred in the structure of the truck fleet from the viewpoint of fuel conservation. Work was begun on complex reconstruction of the Budapest-Ferikhed' airfield in air transport.

During 1976-1980, 25.9 percent more goods were shipped in the GDR than during the previous five-year plan. The volume of freight shipments was increased by 18.9 percent and the freight turnover was increased by 15.9 percent. Freight shipments by rail increased by 7.8 percent and freight turnover increased by 11.3 percent. The fraction of the electrified rail system increased to 20 percent. Implementation of conservation contributed to the shift of a significant part of freight shipments from motor to rail and river transport. The capacity of the commercial fleet of the GDR exceeded 1.9 million tons with launching of nine new ships.

Much was done in the Polish Peoples Republic during 1976-1980 to increase the throughput and carrying capacities of transport. The wide-gauge Chrubeszuw-Katowice rail line and the Warszawa-Katowice main line were turned over for operation and hundreds of kilometers of other lines were modernized. The rail transport of the Polish Peoples Republic received approximately 60,000 modern freight cars and more than 2,000 electric and diesel locomotives. During 1976-1980, 1,280 km of rail lines were electrified, whereas their total length was approximately 7,000 km in 1980, or 28 percent of the operational length of rail lines. The most important electrified lines should include the Terespol'-Warszawa-Poznan-Zbonszynek and the Szczecin-Swinouiscze lines. Construction of a wide-gauge main line railroad (more than 400 km) from Chrubeszow to the Katowice Metallurgical Combine was completed in 1979 to guarantee rhythmic shipments of Soviet iron ore without transshipment. The Warszawa-Katowice motor highway was constructed and turned over for operation and several thousand kilometers of other highways were modernized in motor transport. Civil aviation received Il-62 and Il-62M aircraft from the USSR, which created the capability of opening new long-range lines. Air shipments of passengers has doubled during the past 10 years. The first phase of construction of Gdansk-Sever port for handling large-capacity ships that transport oil and coal has been completed. The deadweight of the Maritime Transport Fleet of the Polish Peoples Republic comprised 4.5 million tons by the end of 1980.

The freight turnover of transport increased by 20 percent while passenger turnover increased by 15.7 percent in the Socialist Republic of Rumania during

the period 1976-1980. The main type of transport in the Socialist Republic of Rumania is rail, the fraction of which exceeds 40 percent in total freight shipments. Intensive modernization and reconstruction of the railroad network were carried out. Automatic interlocking has now been introduced on 35 percent of the lines and 67 percent of switches at stations have been included in electric centralized control. A total of 35 percent of rail lines in Rumania has been electrified, while 65 percent of trains are serviced by diesel locomotives. The length of electrified railroads comprised 2,367 km by the end of 1980. Laying of double tracking, the specific weight of which reaches 21 percent, contributed to an increase of the carrying capacity of the railroads of the Socialist Republic of Rumania. The fraction of freight hauled by motor transport comprises 64 percent in the total volume of shipments, while the freight turnover comprises 16 percent. A program for development of a highway system and for improving the technical development of highways to guarantee traffic safety has been implemented. Almost 1,000 km of highways were modernized and 6,600 km of highways were paved during the last five-year plan. The program of highway reconstruction was fully completed in 1980. The commercial maritime fleet of Rumania was supplemented with ships having total capacity of 1.594 million tons of deadweight, while the deadweight reached 2.606 million tons at the end of 1980, i.e., 2.2-fold more than in 1975. The throughput capacity of Constanza port was increased and operations were conducted to modernize all river and maritime ports. The volume of freight shipped by the maritime fleet (in tons) is 2.5-fold more, while that shipped by the river fleet is twofold more than in 1975. Rumanian air transport was supplied with 26 high-speed passenger aircraft during the past five-year plan and increased by 47.2 percent compared to 1975.

USSR transport achieved further development during the 10th Five-Year Plan (1976-1980) and its technical outfitting was improved. The total freight turnover of all types of transport, including pipelines, increased from 5.5 trillion to 6.8 trillion ton-kilometers, i.e., by 25 percent, while passenger turnover increased from 747 billion to 890 billion passenger-kilometers, i.e., by 20 percent. During the 10th Five-Year Plan, rail transport shipped 18.5 billion tons of various types of freight, or 1.9 billion tons more than during the previous five-year plan. USSR railroads carry more than half the worldwide freight turnover. A total of 3,400 km of new railroads and more than 4,000 km of double tracking has been put into operation in USSR rail transport, 4,600 km has been electrified and 15,500 km of lines have been equipped with automatic interlocking and centralized traffic control. The length of electrified mainlines reached 43,500 km (31 percent of the operational length of the network), on which almost 55 percent of all freight shipments are carried. The builders of the Baykal-Amur Mainline Railroad have laid rails and organized movement of trains on BAM sections 1,620 km long.

The volume of freight shipments by maritime transport increased by 15 percent, while the cargo turnover increased by 16 percent. The USSR Maritime Transport Fleet was supplemented with ships having a total deadweight of 4.26 million tons. The ports and piers in river transport achieved further development. The volume of cargo shipments by general-purpose river transport increased by 20 percent, while the cargo turnover increased by 10 percent during the five-year plan. The specific weight of motor shipments performed by general-purpose transport increased from 28.7 to 30.5 percent.

Work was conducted successfully in construction of new highways. The length of paved highways reached approximately 800,000 km in 1980 and 380,000 km of highways had improved surfaces. Approximately 140,000 km of highways were constructed during 1976-1980 alone.

The total length of USSR air lines comprised 917,000 km by the beginning of 1980, along which civil aviation transported 500 million passengers and 14 million tons of first-class cargo and mail during the past five-year plan.

The volume of shipments by freight transport was increased by 20 percent during the five-year plan in the CSSR, construction of the network of major highways was continued, while steam traction was eliminated in rail transport. A total of 327 km of railroads was electrified, while 215 km of railroads was equipped with automatic interlocking. New sections of subway and the Prague-Bratislava major highway were turned over for operation. Reconstruction of the Prague railroad terminal and construction of the southern rail line to Slovakia were also continued. The volume of freight shipments increased by 20 percent during 1976-1980, of which 5 percent goes to rail transport, 11 percent goes to motor transport and 30 percent goes to intraplant transport. Freight shipments by river transport increased by 83 percent.

The main method of organizing cooperation and of intensifying international sharing of labor among CEMA members is undoubtedly coordination of plans. Extensive work has recently been conducted in CEMA member countries on compilation of national economic plans for the current five-year plan and for their coordination within the framework of CEMA. The results of this important and complex work were summarized at the 35th Session of the CEMA meeting in July 1981.

The growth of economics and expansion of economic ties require further development and improvement of the transport system of CEMA members, which should meet the increased needs of the national economy and of the population for shipments both in individual countries and on an international scale as well. This task of transport was reflected in the plans of CEMA members for 1981-1985.

Freight shipments will increase by 20 percent up to 1985 in the Peoples Republic of Bulgaria, while passenger shipments will increase by 10 percent. Rail transport will have priority in development of transport. It has been suggested that 650-700 km of lines be electrified and that other tracks with a length of 400 km be constructed. A total of 65-70 percent of motor vehicles has been equipped with diesel engines.

During the current five-year plan, 320 km of lines are supposed to be electrified in the Hungarian Peoples Republic, which will permit an increase of their length by more than 24 percent and will permit an increase to 73 percent by 1990. By the end of 1985, 58-60 percent of the carrying capacity of Hungarian railroads should be performed by electric traction. The plan for development of the rail network provides for equipping 640 km of lines with automatic interlocking devices, for increasing the length of lines suitable for axle loads of more than 20 tons of 65 to 73 percent, elimination of steam traction, development of container and packet shipments and also an increase of the level of

mechanization of loading operations. The railroads propose to increase the annual volume of shipped tonnage by 1.1 percent up to 1985 with a simultaneous increase of freight turnover by 5.2 percent during the entire planning period. During this period, 1,300 km of railroad tracks should be modernized.

Decisive measures will be undertaken in the GDR to reduce transport expenses and for continuous intensification of transport processes. All freight will be shipped more efficiently and by the shortest route with lower fuel and energy consumption. It is planned to electrify 700-750 km of railroads at accelerated rates prior to 1985 and to connect the capital of the GDR--Berlin--to the network of electrified railroads. At the same time, the rail transport of the GDR should increase its capacity and should reduce specific energy consumption by 28 percent. The output of the railroad network will be increased due to electrification of 700-750 km of tracks. More efficient operating techniques will be introduced for better utilization of the fleet of rail cars and locomotives and also of transport structures and more feasible methods of operation of rail transport from the energy viewpoint will be introduced by using microelectronics. The total freight turnover inside the country should increase by 6-8 percent by 1985. The capacity of the commercial fleet will be increased by 14-16 percent in maritime transport, primarily due to intensification of its use. The handling capacity of the maritime ports should increase by 44-46 percent; while the freight turnover of rail transport should increase by 13 percent.

Acceleration of electrification of railroad tracks is planned in the Polish Peoples Republic. A repair base for transport and its support with the necessary deliveries of spare parts will be developed. It has been suggested that 9,000 km of highways be constructed and that approximately 21,000 km of highways be modernized prior to 1985. It is planned that cargo shipments by water transport should be almost doubled in 1985.

It is planned that 40 percent of the rail lines in the Socialist Republic of Rumania will be equipped with automatic interlocking by 1985 and that 81 percent of switches will be included in centralized traffic control. Development of centralized traffic control systems using computers is envisioned for further improvement of traffic control operations. Further equipping of railroads with new rolling stock and an increase of the length of double tracking and electrified lines are envisioned by the five-year plan for 1981-1985 with regard to the fact that the railroads will remain the main type of transport in the Socialist Republic of Rumania. The annual increase of freight shipments by rail transport should comprise 18-20 percent. Bridges across the Borchia channel, near Feteshti and across the Danube River, near Cernavody, will become operational. Operation of the Kurtia-de-Ardzhes--Rymnicul-Vylcha line, which will shorten the crossing through the Carpathian Mountains, will also begin. A great deal of attention will be devoted in motor transport to conversion of the motor fleet to diesels and the fleet of medium- and large-capacity truck trailers and of the dump truck fleet will increase. Putting the navigable Danube-Black Sea canal into operation will be of special significance for increasing river shipments. Construction of the Bucharest-Danube canal is also planned. The five-year plan (1981-1985) designates a new phase in development of ports. Development and modernization of airports are also envisioned in air transport.

The freight turnover of all types of transport will increase by 19 percent during the 11th Five-Year Plan in the USSR, while the passenger turnover will increase by 15.5 percent. It is planned to increase the total freight turnover of railroads by 14-15 percent and to increase passenger turnover by 9 percent. More than 5,000 km of double tracking should be put into operation, approximately 6,000 km of lines should be electrified, 15,000 km should be equipped with automatic interlocking and centralized traffic control and no less than 3,600 km of new rail lines should be constructed. Train traffic will be opened over the entire length of the Baykal Amur Mainline Railroad. An increase of the cargo turnover of maritime transport by more than 9 percent is envisioned. The fleet will be supplemented with nuclear-powered cargo ships. The material and technical base of river transport will be strengthened considerably. It will be equipped with large-capacity ships, mixed river-sea ships and so on. The cargo turnover should be increased by 19-20 percent. Motor transport will be developed at high rates and the freight turnover will increase by 33 percent. Tasks will also be determined for construction and reconstruction of such important major highways as the Moscow-Simferopol', Moscow-Minsk-Brest and a number of others. Development of the airport network on major and local air lines will be continued in air transport and they will be equipped with modern means of mechanization and automation of transshipping processes and aircraft maintenance. An important step will be made in pipeline transport. Not only oil and gas, but a significant part of petroleum products will be transported through pipes. The freight turnover of oil pipeline transport will be increased by approximately 14 percent during the five-year plan.

Rail transport will be primarily developed in the CSSR as the main link of the state transport system. It is by rail that coal, ore, scrap metal and export goods will be primarily shipped. The task of seeing that the specific weight of rail transport in the total volume of shipments comprise no less than 70 percent in 1985 has been set. Rail transport will be developed during the current five-year plan in the CSSR by electrification of railroads (up to 25 percent of the entire network) and equipping them with automatic interlocking, increasing the capacity of major tracks and important lines and also of more important railroad junctions. Water transport, which is less energy-consuming and more advantageous, will be used to a significant degree. The funds for capital investments will be directed primarily toward these two types of transport with restriction of construction of major highways and capital investments for air transport. A great deal of attention is being devoted to the use of progressive systems of freight transport in containers and pallets, which will increase the economy of shipments. It is planned that freight shipments will be increased by 7-9 percent.

One of the significant tasks will be to reduce the transshipping needs of the national economy by 5 percent by reducing the material consumption of production, by elimination of inefficient cooperation and specialization, by reducing inefficient counter shipments of freight and by acceleration of loading-unloading operations. A new normal-gauge rail junction between the CSSR and the USSR will be constructed and construction of the southern rail line to Slovakia will be continued. The volume of freight shipments by motor transport will be increased by 8-10 percent during this period, while the volume of freight shipments by water transport will be increased by approximately 50 percent.

Analysis of the development of international freight shipments among CEMA members for 1981-1985 shows that their volume will increase by 17.6 percent in ton-kilometers compared to the previous five-year plan. The fraction of semifinished products and finished products in mutual shipments will be increased and the rate of growth of the total volume of gross shipments will slow down. The fraction of participation of individual types of transport in organization of international freight shipments should comprise 46.4 percent of rail shipments, 22.4 percent of maritime shipments, 3.8 percent of river shipments, 27 percent of pipeline shipments and 0.4 percent of motor shipments in 1985.

Implementation of the long-term specific program of cooperation in development of transport ties will contribute to solution of many problems of international economic and commercial relations of CEMA members. The DTsPS [long-range specific program for cooperation] will permit CEMA members to determine their long-range transport policy in solution of nodal problems of improving international transport ties, of planning measures to fulfill them, to mobilize resources and also to coordinate deadlines and executors.

Measures on cooperation included in the DTsPS are being implemented mainly through a system of multilateral and bilateral agreements, concluded on the basis of technical and economic developments and documentation, where the mutual obligations of the parties are fixed.

A total of 20 of 22 agreements provided by the DTsPS has now been signed. The obligations of CEMA members contained in the agreements concluded by them have been reflected in the five-year and long-term national plans. This is true of such important measures as cooperation to increase the capacity of international rail lines, in construction of new and development of existing border stations and border rail junctions, cooperation in the field of reconstruction and expansion of maritime ports, improvement of organization and development of international water shipments, cooperation to increase the capacity of international highways, development of international airports, support of repair of aviation equipment, cooperation in the field of container shipments, support of shipments of especially heavy and large freight and so on.

An increase of the capacity of international communications routes in accordance with an increase of shipments will guarantee normal operating conditions for transport and the required maneuverability and mobility of the international network. Improvement of the structural composition of the network of all types of transport will contribute to solution of this problem according to the requirements of bringing it up to major standards and efficient distribution of the shipping operations between types of transport and by the directions of shipments.

Formation of the international rail network used in communications among CEMA members has been mainly completed. We are now talking about modernization and technical improvement of this network. The basic measures of the DTsPS, which concern rail transport, will be concentrated in development of a network approximately 19,000 km long, in which the majority of freight and passenger shipments will be accomplished in communications among CEMA members. The main

directions for increasing the capacities of the international rail network are construction of double tracking, electrification of lines, introduction of more modern STsB [signallization, centralization and blocking] and communications systems on them, intensification of the track superstructure and development of receiving-dispatch track and transshipping facilities of border stations.

The measures that follow from the DTsPS to increase the level of the technical parameters of international highways among CEMA members primarily concern four highways (8,500 km) that link the capitals of all the European members of CEMA to each other and their most important administrative, economic and cultural centers, namely, Berlin-Warszawa-Moscow, Rostok-Berlin-Prague-Bratislava-Budapest-Bucharest-Konstanza, Gdansk-Warszawa-Katowice-Bratislava-Budapest-Seged-Nadlak (Hungarian Peoples Republic)-Nadlak (Socialist Republic of Rumania)-Timishoara-Drobeta-Turnu-Severin--Krayova-Bucharest-Konstanza and Krayova-Kalafat-Vidin-Botevgrad-Sofia and Moscow-Kishinev-Bucharest-Sofia.

Improvement of the technical equipping in all types of transport is directed:

- toward increasing the power available per worker in all sections of the transport process and increasing the total and unit capacity of traction equipment and power plants with a simultaneous increase of their economy;

- toward an increase of the capacity and travel speed of rolling stock of all types of transport and development of complex mechanization and automation of transport processes and operations;

- toward improvement of existing and development of new transport hardware, new materials and structures having the purpose of increasing the degree of guaranteeing the preservation of transported freight, traffic safety, an increase of the service life and operating reliability of structures during operation with minimization of human and public labor expenditures on maintenance, servicing and repair of transport equipment;

- toward development of new types of rolling stock, improvement of the forms and methods of freight shipment and handling with regard to the change of their structure due to the effect of development of international sharing of labor and technical progress in the sphere of material production;

- toward improvement of transport equipment with regard to the requirements of reducing the negative effects on the environment (the level of atmospheric and water pollution, noise level and so on).

Complete and timely fulfillment of the tasks ensuing from the national plans for development of transport and ensuing from the DTsPS for development of transport ties will be an important condition for solving the problem of transport support of further intensification and improvement of cooperation and development of the economic integration of CEMA members.

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